

# **Performance Report on Surface Streets in the Seattle Central Business District**

## **Volume 7: Sixth Update – Tunnel Re-Opening February 29, 2008**



As required by the Agreement between King County, City of Seattle and Sound Transit, as revised June 24, 2002, for the Downtown Seattle Transit Tunnel and Related Facilities.

Prepared by the Monitor and Maintain Committee, with representation from the following agencies:



City of Seattle



King County



SOUNDTRANSIT

communitytransit

PIERCE  
TRANSIT

## Table of Contents

<b>REPORT PURPOSE.....</b>	<b>1</b>
<b>EXECUTIVE SUMMARY ON TUNNEL RE-OPENING, SEPTEMBER 2007 .....</b>	<b>3</b>
<b>TRANSIT SERVICE PLAN FOR TUNNEL RE-OPENING.....</b>	<b>7</b>
<b>NINTH AVENUE CONTRAFLOW LANE.....</b>	<b>9</b>
<b>CUSTOMER OUTREACH FOR SEPTEMBER 2007 SERVICE CHANGE .....</b>	<b>10</b>
<b>MEASURE 1: TRANSIT TRAVEL TIME .....</b>	<b>11</b>
MONITORING OBJECTIVES .....	11
METHODOLOGY.....	11
TRANSIT TRAVEL TIME COMPARISON.....	13
SUMMARY CONCLUSIONS .....	19
<b>MEASURE 2: GENERAL PURPOSE TRAFFIC OPERATIONS.....</b>	<b>20</b>
MONITORING OBJECTIVES .....	20
METHODOLOGY.....	20
KEY OBSERVATIONS.....	20
SUMMARY OF DATA COLLECTED.....	21
<b>MEASURE 3: TRANSIT RIDERSHIP AND BUS VOLUMES.....</b>	<b>26</b>
MONITORING OBJECTIVES .....	26
METHODOLOGY.....	26
BUS VOLUMES.....	26
TRANSIT RIDERSHIP VOLUMES .....	30
<b>MEASURE 4: PEDESTRIAN ACTIVITY AT BUS ZONES.....</b>	<b>32</b>
MONITORING OBJECTIVES .....	32
METHODOLOGY.....	32
SUMMARY OBSERVATIONS .....	35
<b>MEASURE 5: SEATTLE CENTRAL BUSINESS DISTRICT CUSTOMER SURVEYS .....</b>	<b>36</b>
BACKGROUND .....	36
METHODOLOGY.....	36
QUESTIONNAIRE DEVELOPMENT .....	36
CLUSTER SELECTION .....	37
RECRUITMENT .....	37
DATA COLLECTION .....	38
ANALYSIS AND REPORTING .....	38
KEY FINDINGS.....	40
<b>MEASURE 6: TRANSPORTATION DEMAND MANAGEMENT PROGRAM.....</b>	<b>53</b>
GOALS AND OBJECTIVES.....	53
DATA COLLECTION .....	53
SUMMARY.....	53
PROGRAM NOTES .....	55

## Table of Figures

Figure 1. Performance Report Release Dates.....	2
Figure 2. Ninth Avenue Contraflow Lane Removal .....	9
Figure 3. Transit Travel Time Summary Analysis Corridors and Detection Point Locations .....	12
Figure 4. Downtown Seattle Travel Time Index.....	14
Figure 5. Transit Corridor Travel Time Comparisons Before and After Tunnel Closure .....	15
Figure 6A. First Avenue Transit Travel Time and Variation .....	15
Figure 6A. First Avenue Transit Travel Time and Variation .....	16
Figure 6B. Second Avenue Transit Travel Time and Variation.....	16
Figure 6C. Third Avenue Transit Travel Time and Variation.....	17
Figure 6D. Fourth Avenue Transit Travel Time and Variation.....	17
Figure 6E. Virginia, Olive Way and Howell Transit Travel Time and Variation .....	18
Figure 6F. Stewart Street Transit Travel Time and Variation.....	19
Figure 7A. General Purpose Travel Time AM Peak (7-9 AM).....	22
Figure 7B. General Purpose Travel Time Off Peak (1-3 PM).....	22
Figure 7C. General Purpose Travel Time PM Peak (4 - 6 PM) .....	23
Figure 8A. Average Daily and PM Peak Traffic Volumes .....	24
Figure 8B. Changes in Average Daily and PM Peak Traffic Volumes .....	25
Figure 9A. PM Peak Hour Transit Volumes, February 2004 - Pre-Tunnel Closure Baseline Report .....	27
Figure 9B. Average PM Peak Hour Transit Volumes during Tunnel Closure .....	28
Figure 9C. Current (January 2008) PM Peak Hour Transit Volumes after Tunnel Re-opening.....	29
Figure 10. Passenger Loads at University Street, before Tunnel Closure (spring 2005), during Tunnel Closure (spring 2007), and after Tunnel Re-opening (fall 2007) .....	30
Figure 11. Loads over Seating Capacity at University Street, before and during Tunnel Closure and after Tunnel Re-opening...	31
Figure 12. Percent of trips leaving CBD Averaging Standing Loads, before, during, and after Tunnel Closure and Re-opening.	31
Figure 13. Bus Stops Surveyed for Pedestrian Congestion Counts.....	33
Figure 14A. Walking Pedestrian Rank and Level of Service by Bus Stop.....	34
Figure 14B. Standing Pedestrian Level of Service for Full Bus Stop Area and Critical Loading Zone .....	34
Figure 15. Telephone Survey Sample Disposition.....	37
Figure 16. Respondent Characteristics by Cluster Type <i>All 2006 survey respondents</i> .....	39
Figure 17A. Travel to Downtown Seattle Compared to Last Year <i>Bus cluster respondents not living in downtown Seattle</i> .....	41
Figure 17B Travel to Downtown Seattle Compared to Last Year <i>Garage/Lot respondents not living in downtown Seattle</i> .....	41
Figure 17C Travel to Downtown Seattle Compared to Last Year <i>On-street cluster respondents not living in downtown Seattle</i> ..	41
Figure 18A Time of Day Travel to Downtown Seattle by Purpose <i>All bus cluster respondents</i> .....	42
Figure 18B. Time of Day Travel to Downtown Seattle by Purpose <i>All garage/lot respondents</i> .....	43
Figure 18C. Time of Day Travel to Downtown Seattle by Trip Purpose <i>All on-street cluster respondents</i> .....	43
Figure 19A Total Travel Time to Work/School <i>Bus cluster respondents who travel downtown by bus or car/carpool</i> .....	44
Figure 19B. Total Travel Time to Work/School <i>Garage/lot respondents who travel downtown by bus or car/carpool</i> .....	45
Figure 19C. Total Travel Time to Work/School <i>On-street parking respondents who travel downtown by bus or car/carpool</i> .....	45
Figure 20A. Satisfaction with Ability to Walk Around Without Feeling Crowded <i>Bus cluster respondents who travel downtown by bus, car or carpool</i> .....	46
Figure 20B. Satisfaction with Ability to Walk Around Without Feeling Crowded <i>Garage/Lot Cluster respondents who travel downtown by bus, car or carpool</i> .....	46
Figure 20C. Satisfaction with Ability to Walk Around Without Feeling Crowded <i>On-Street Parking Cluster respondents who travel downtown by bus, car or carpool</i> .....	47
Figure 21A. Satisfaction with Personal Security and Safety <i>Bus cluster respondents who travel downtown by bus, car or carpool</i> .....	47
Figure 21B. Satisfaction with Personal Security and Safety <i>Garage/Lot Cluster respondents who travel downtown by bus, car or carpool</i> .....	48
Figure 21C. Satisfaction with Personal Security and Safety <i>On-street parking cluster respondents who travel downtown by bus, car or carpool</i> .....	48
Figure 22A. Overall Impression of Downtown Seattle <i>All bus cluster respondents</i> .....	51
Figure 22B. Overall Impression of Downtown Seattle <i>All garage/lot cluster respondents</i> .....	52
Figure 22C. Overall Impression of Downtown Seattle <i>All on-street parking cluster respondents</i> .....	52
Figure 23. Transportation Demand Management Reporting Period Data (June 2007- November 2007) .....	54

## Report Purpose

This Volume 7 report, and all of the previous Volumes 1 through 6 of this report, were developed to provide the documentation required to satisfy the requirements of Section 10.3 of the “Agreement Regarding the Design, Construction and Operation of the Downtown Seattle Transit Tunnel and Related Facilities”, as executed by the City of Seattle, King County and Sound Transit. With the release of Volume 7, the *Performance Report on Surface Streets in the Seattle Central Business District* is complete and the requirement of Section 10.3 have been satisfied.

The applicable excerpts from Section 10.3 of this Agreement read as follows:

“It is the Parties’ intent that the Downtown Seattle Traffic and Street Improvements will be sufficient to maintain bus service performance on surface streets in downtown Seattle, during the closure period and after the tunnel is re-opened at performance levels similar to those existing prior to the Closure Period. The Parties hereby establish a Monitor and Maintain Committee (M&M Committee) to be comprised of the designated contacts set forth in Section 20.0. The M&M Committee may be expanded to include participation by other public agencies at the discretion of the Parties. The M&M Committee shall conduct baseline studies of bus travel time and passenger convenience, security, safety and comfort during a measurement period prior to the Closure Period (Baseline Measurement Period.)”

“During the Closure Period and for one year after the Tunnel is re-opened, the M&M Committee shall continue to monitor downtown Seattle transportation system performance and make recommendations to the Parties to take actions to maintain said system performance. In performing its functions, the Committee shall be directed to (a) consult with and seek input from suburban stakeholders and (b) report quarterly to the City Council’s Transportation Committee regarding the performance of the downtown transportation system and regarding the Committee’s consultation with various stakeholders.”

The M&M Committee issued its first performance report in September 2005 just prior to tunnel closure. Volume 1 of the report documented pre-tunnel closure conditions for six specific performance measures. Data for this initial baseline report was collected during the spring and summer of 2005. The six performance measures that have been tracked are as follows:

- Transit travel time
- General purpose traffic operations
- Transit ridership and bus volumes
- Pedestrian activity at bus zones
- Seattle Central Business District (CBD) Customer Surveys
- Transportation Demand Management (TDM) mitigation programs

Each of these six performance studies was funded as a project within the overall Tunnel Agreement.

Volume 2 of the report issued January 2006 provided an initial assessment of how the tunnel closure plan performed overall, and summarized the contingency planning effort that took place in the first 90 days following tunnel closure. The data sets used for Volume 2 were collected in the fall of 2005, following tunnel closure and extended up to the beginning of the Thanksgiving holidays. This allowed for a better comparison of before and after tunnel closure conditions in the Seattle central business district for non-holiday times.

Volume 3 of the report issued March 2006 provided updates on a subset of the six performance measures. Specifically, Volume 3 updated information on Measures 1, 3 and 4 and summarized the effect of a set of

measures implemented after the release of Volume 2 to address issues identified after tunnel closure. The reported measures were: transit travel time; transit ridership and bus volumes; and pedestrian activity at bus zones. For Volume 3, transit travel time and bus volumes were derived from the first two weeks in February following the spring 2006 service change. Transit ridership figures were derived from the fall 2005 service change that ended on February 11, 2006. Pedestrian activity at bus stops was derived from a survey taken in late February/early March.

The Volume 4 report issued in August 2006 provided updated information on five of the six performance measures. Data was available for all measures except data related to pedestrian activity at bus zones. Transit travel times for this report were derived from the first seven weeks of the summer 2006 service change. Transit ridership data was taken from the spring 2006 service change. Most of the post-tunnel closure traffic data for this report was collected in May, 2006.

The Volume 5 issued January 2007 updated four of the six performance measures. These included the following: transit travel time, transit ridership and bus volumes, surveys of Seattle central business district customers, and TDM mitigation programs. Transit travel time and bus volumes were derived from the data from October 2006 up to the Thanksgiving holiday. Transit ridership figures were derived using data from the fall, 2006 service change.

The Volume 6 report updated three of the six performance measures. These included transit travel time; transit ridership and bus volumes; and TDM mitigation programs. Transit travel time and bus volumes were derived using data from February 2007. Transit ridership figures were derived using data from the winter 2007 service change.

The Volume 7 Report is the last installment of the “Performance Report on Surface Street in the Seattle Central Business District.” It includes updates on all six of the performance measures following the re-opening of the downtown tunnel in September 24, 2007. Transit travel times and bus volumes were derived from fall 2007 data.

Figure 1 summarizes the tunnel status, contents and release dates for all seven volumes of this Report.

**Figure 1. Performance Report Release Dates**

	Performance Report Release Dates						
Tunnel Status	Open	Closed	Closed	Closed	Closed	Closed	Open
Performance Measure Updates	Complete	Complete	Complete	Complete	Complete	Complete	Complete
	Sept 05	Jan 06	March 06	Aug 06	Jan 07	Jul 07	Feb 08
	Volume 1	Volume 2	Volume 3	Volume 4	Volume 5	Volume 6	Volume 7
Transit Travel Time	⊙	⊙	⊙	⊙	⊙	⊙	⊙
General Purpose Traffic Operations	⊙	⊙		⊙			⊙
Transit Ridership and Bus Volumes	⊙	⊙	⊙	⊙	⊙	⊙	⊙
Pedestrian Activity at Bus Zones	⊙	⊙	⊙				⊙
Surveys of CBD customers	⊙			⊙	⊙		⊙
TDM mitigation programs	⊙	⊙		⊙	⊙	⊙	⊙

## Executive Summary on Tunnel Re-Opening, September 2007

Volume 7 of this Report summarizes the tunnel re-opening experience in the Seattle Central Business District after September 24, 2007

There are results for all six of the evaluation programs that compose the evaluation effort. Key highlights from each of the six monitoring programs are as follows:

### Transit Travel Time & Reliability

The first level of analysis for downtown transit travel time is a composite measurement of average time spent in the study area. This value is obtained by identifying the first and last observation of a bus trip in the CBD, regardless of the corridor. Averaging this figure for all trips results in a single value of time spent in the CBD for all observed trips. This value is used as an index, not a measure. This figure includes layover time as well as through-routed trips under one measurement. It will also include many different paths through the CBD with different lengths and travel conditions. The measure becomes meaningful when compared to the same measurement for different time periods to compare the ease of travel for transit through the CBD.

The data used for this reporting period was collected from October 1, 2007 to November 9, 2007. The Travel Time index for this reporting period is **74**, based on an average travel time of 16:21. The baseline Travel Time Index is **100**, representing the value before tunnel closure. The average travel time value at that time was determined to be 21:59, based on bus trips between 4 - 6 PM on weekdays during the month of July, 2005. The current index represents a **26%** decrease in time spent in the downtown core over the pre-tunnel closure baseline, and an **18%** decrease from the previous post-tunnel closure report. Travel time variability is still consistently good and also much improved over the same period in 2005.

At the corridor level, travel time comparisons were made using baseline data collected before tunnel closure, the five sets of post tunnel data available from Volumes 2 through 6, and now Volume 7 after tunnel re-opening.

A review of the travel time indexes in conjunction with corridor specific travel time data, starting with the pre-tunnel closure baseline, through tunnel closure and concluding with tunnel reopening, yields the following observations:

- Transit improvements reduced surface travel times by roughly one fourth, while accommodating more than 100 additional trips per hour that were displaced from the tunnel.
- Third Avenue peak period restrictions improved travel time on that corridor by one to two minutes depending on time of day, while accommodating almost 100 additional trips per hour
- A seasonal trend appears to exist where fall travel times are slower than spring and summer travel times.
- Maintaining the surface transit improvements in conjunction with the re-opening of the tunnel appears to have offset most of the fall seasonal increase in surface travel time, while improving Second Avenue travel times by more than one and a half minutes in the critical PM Peak.

### General Purpose Traffic Operations

The City measured downtown traffic conditions before tunnel closure, during tunnel closure and after tunnel re-opening to assess the impacts of tunnel closure on general purpose traffic operations.

Traffic data were collected in January 2005 (before tunnel closure), October 2005 and May 2006 (during tunnel closure), and October/November 2007 (after tunnel re-opening). A summary of the key findings pertaining to general purpose traffic operations are provided below, primarily by comparisons between the survey conducted after tunnel re-opening with prior surveys.

During the AM peak period, the following conditions were observed:

- Travel times on northbound and southbound First Avenue and eastbound Spring Street increased after tunnel re-opening.
- Travel times on eastbound Olive Way, which decreased substantially after tunnel closure, continue to increase and are now approaching pre-tunnel closure levels.
- Travel times decreased after tunnel re-opening on northbound Fourth Avenue, southbound Fifth Avenue, westbound Stewart Street, and eastbound Cherry Street.

During the mid-day or off-peak period, the following conditions were observed:

- Travel times increased on northbound Fourth Avenue and southbound Fifth Avenue.
- Travel times on most other corridors have decreased or have remained at or near pre-tunnel closure levels.

During the PM peak period, the following conditions were observed:

- Travel times increased substantially on northbound Fourth Avenue between Royal Brougham Way and South Washington Street, and between James Street and Olive Way.
- Travel times increased substantially on eastbound Spring Street. The City recently adjusted parking restrictions on Spring Street to address traffic backups observed on this corridor. However, travel time observations were limited to one or two days per corridor. These results may reflect specific conditions that occurred on those days only.
- Travel times on southbound Second Avenue remained well below pre-tunnel closure levels, and travel times decreased substantially on eastbound Cherry Street.

#### Transit Ridership and Bus Volumes

Prior to tunnel closure, the primary concern regarding ridership was that ridership on transit trips entering the CBD might exceed the available capacity, leading to unacceptable overloads. To address this concern, University Street, approximately in the middle of the CBD, was established as a screenline. The total volume of riders crossing this screenline, regardless of origin or destination, was measured for pre-closure baseline conditions, and for post-closure conditions. It was also been measured for tunnel re-opening conditions in 2007.

Approximately 95,000 north-south riders crossed the downtown screenline at University Street on weekdays in fall 2004 before tunnel closure. As part of a general increase in ridership, this number increased to almost 106,700 weekday riders in spring 2005. Ridership in spring 2007, just before tunnel re-opening was almost three percent higher than spring 2005, at 109,400 weekday riders. Preliminary data for fall 2007 suggest that loads crossing University Street after tunnel re-opening rose to over 115,000 weekday riders as of October and November. This increase was expected, since tunnel re-opening meant travel times across the CBD have decreased, encouraging more ride free area trips.

Average weekday loads increased by approximately 5 percent after tunnel re-opening, and were 8 percent higher than in spring 2005. Loads crossing the screenline in the tunnel in both directions increased by about 5 percent. The total load crossing the screenline during the peak hour from 4:30 to 5:30 PM increased by about 22 percent after tunnel re-opening, when compared to spring 2007, bearing out predictions of a latent demand for cross-CBD trips that had been suppressed by tunnel closure.

Since tunnel re-opening was accompanied by the reassignment of additional routes to Third Avenue, as well as the assignment of routes into the tunnel, all of the avenues except Third saw significant decreases in the amount of load crossing the screenline.

With regard to bus volumes, the re-opening of the tunnel was accompanied not only by the reassignment of routes back to the tunnel but also by the reassignment of routes on surface streets in order to continue to fully utilize the capacity on Third Avenue made possible by the retention of the peak hour traffic restrictions and skip stop operation that was implemented during tunnel closure. In comparing bus volumes by street segment for before and after tunnel re-opening, bus volumes were shifted primarily from Second and Fourth Avenues onto Third Avenue. Bus volumes on Second Avenue were reduced by approximately 26%; bus volumes on Fourth Avenue were reduced by approximately 20%.

#### Pedestrian Activity at Bus Zones

Conditions for walking pedestrians were relatively consistent across all survey periods for the eight bus zones included in the fall 2007 survey. Overall, the level of service for walking pedestrians appears to be relatively unaffected by either the closure or the re-opening of the Third Avenue transit tunnel. Level of service is more affected by localized changes related to the available sidewalk space.

For waiting pedestrians, most of the eight bus zones included in the fall 2007 survey are operating under “Desirable” conditions at LOS A. However, three of the locations have degraded slightly over conditions that were observed before and during tunnel closure, as described below:

- Zone 860 (NB 5th Ave & James St): This bus zone continues to be the most crowded of the study locations during the PM peak. The number standing pedestrians in the critical loading zone has increased over the previous study; however, the number is not as high as conditions just after tunnel closure (fall 2005). This zone also has the narrowest sidewalk of all of the study zones, which contributes to its high level of crowding.
- Zones 431 and 578 (NB and SB 3rd Ave & Pike St): These bus zones operated at LOS A and “Constrained” conditions during the fall 2007 study, which is slightly degraded from the conditions during tunnel closure. This is likely due to the addition of several high-ridership routes to Third Avenue during the tunnel re-opening. In addition, the overall increases in Metro ridership between 2005 and 2007 have likely increased the usage of these bus stops.

Even with the bus zones operating at a lower level of service or rank than previous surveys, all of the bus zones operated at or above LOS C and at or above “Constrained” conditions in the fall 2007 survey, which are deemed to be acceptable levels of service for waiting pedestrians in an urban environment.

#### Seattle Central Business District Customer Surveys

The tunnel re-opening does not appear to have significantly affected travel to and within downtown Seattle. Most respondents are coming downtown about as often as they did a year ago and those who ride the bus are either satisfied with how the tunnel opening has affected their downtown travel or they do not have an opinion one way or the other.

While many items in the survey did not change significantly from 2006 to 2007 a pattern of decline in satisfaction with respect to feeling comfortable and safe downtown was noted. Respondents have noticed more crowding of late, and while they are still satisfied with their personal security and safety in downtown, significantly fewer respondents feel “very satisfied” than in the past. The survey instrument does not allow any conclusions to be drawn about the reasons for this change.

For those who travel downtown by car, lack of parking and cost continue to detract from their overall downtown experience.

While bus riders get a great deal of information from transit agencies, it is much more difficult to attract the attention of car travelers as evidenced by the fact that 65% of those who only travel to downtown Seattle by car did not see any information about the tunnel after it opened on September 24.



### Transportation Demand Management Programs

The package of Transportation Demand Management (TDM) programs introduced in support of tunnel closure has successfully expanded participation in commute options. Some highlights from this program include:

- Over 650 individuals received transit information at Plan Your Commute tables this period. Of the 571 people who pledged to reduce their drive alone trips, nearly 350 of them reported completing their pledge, eliminating an estimated 14,000 vehicle miles of travel (VMT).
- 7,000 individuals and 70 businesses joined Flexcar (renamed Zipcar) in the last period of tunnel closure mitigation efforts.
- 89 individual Puget Pass holders signed up for the Home Free Guarantee (HFG) in the third period, bringing the total to over 750 since program initiation.
- Registration activity at Rideshare Online continues at an accelerated pace, with 612 new registrants this period and about 2,270 total registrations by downtown employees since DSTT closure.
- The number of merchants participating in the current edition of the *Shop, Dine & Ride* book remains at 144.
- Some TDM efforts will be continuing through 2008, including Home Free Guarantee for individuals buying Metro passes and telework support for new programs. In addition, a new effort has been initiated to enhance bicycle commuting, specifically by improving bike/bus connections.

## Transit Service Plan for Tunnel Re-Opening

The retrofitted Downtown Seattle Transit Tunnel re-opened for bus service in September 2007. Although only buses will operate in the tunnel until Link Light Rail (LRT) start-up in 2009, bus service in the re-opened tunnel will operate under joint bus/LRT operating rules. The rules for joint bus/LRT operation limits the peak number of buses per hour, per direction to sixty. Prior to tunnel closure, tunnel bus volumes per hour were 6% to 10% higher depending, on the direction and time of day.

In determining what routes would be assigned to use the tunnel and what routes would remain on surface streets, the following objectives were used to guide the design the tunnel re-opening service plan:

### Primary Objectives

- Maximize use of the tunnel up to the allowable limit of 60/peak hour/direction; balance the northbound/southbound bus volumes and use the tunnels capacity throughout the day.
- Assign routes to the tunnel that make the best use of 60 passenger hybrid tunnel buses.
- Tunnel assignments should maintain a geographic balance.
- Make best use of the continued transit priority measures along Third Avenue.
- Maintain balanced bus volumes between skip stop zones on Second, Third, and Fourth Avenues.
- Minimize the need for future downtown Seattle changes with Link, RapidRide, Alaskan Way Viaduct replacement and other major projects.

### Secondary Objectives

- Group tunnel routes to provide combined service to common destinations.
- Routes should have good access to/from tunnel portals at Convention Place Station & the busway/Royal Brougham.
- Return former tunnel routes as appropriate given these objectives
- Provide access to/from downtown Seattle that is direct and as fast as possible, minimizing the need for additional running time.

Although there are fewer routes that were returned to the tunnel in September, 2007 - 18 routes versus the 21 routes that operated in the tunnel before the 2005 closure - the number of daily bus trips remains close to pre-closure levels. About 1,075 daily trips now operate through the tunnel after re-opening in September 2007 compared to 1,105 trips in 2005. There is also better utilization of tunnel midday as more all day services was assigned to the tunnel in order to take advantage of the speed and reliability that tunnel operation affords. Midday bus trips increases by 13% over 2005 tunnel operation.

### Route Assignments

A summary of the key elements of the September 2007 service change are provided below:

#### Routes Assigned to the Tunnel:

##### Former all-day Tunnel routes:

- 41, 71, 72, 73, 101, 106, 150, 194, 255, 550

##### Former peak-only Tunnel routes:

- 212, 225, 229, 256, 301

Routes new to the Tunnel:

- 174 (all-day)
- 74E (peak-only)
- 217 (AM peak only)

Third Avenue Route Assignments – By Avenue & Direction

Moving From 2nd Avenue – Southbound:

- 2E, 17/23, 35, 113, 116-118-119, 120, 121-122, 123, 125

Moving From 5th Avenue – Southbound:

- 5/54-55, 16, 66, 358

Moving From 1st Avenue – Northbound:

- 5/54-55, 21E, 56E, 120

Moving From 4th Avenue – Northbound:

- 17/23, 35, 116/118/119, 123

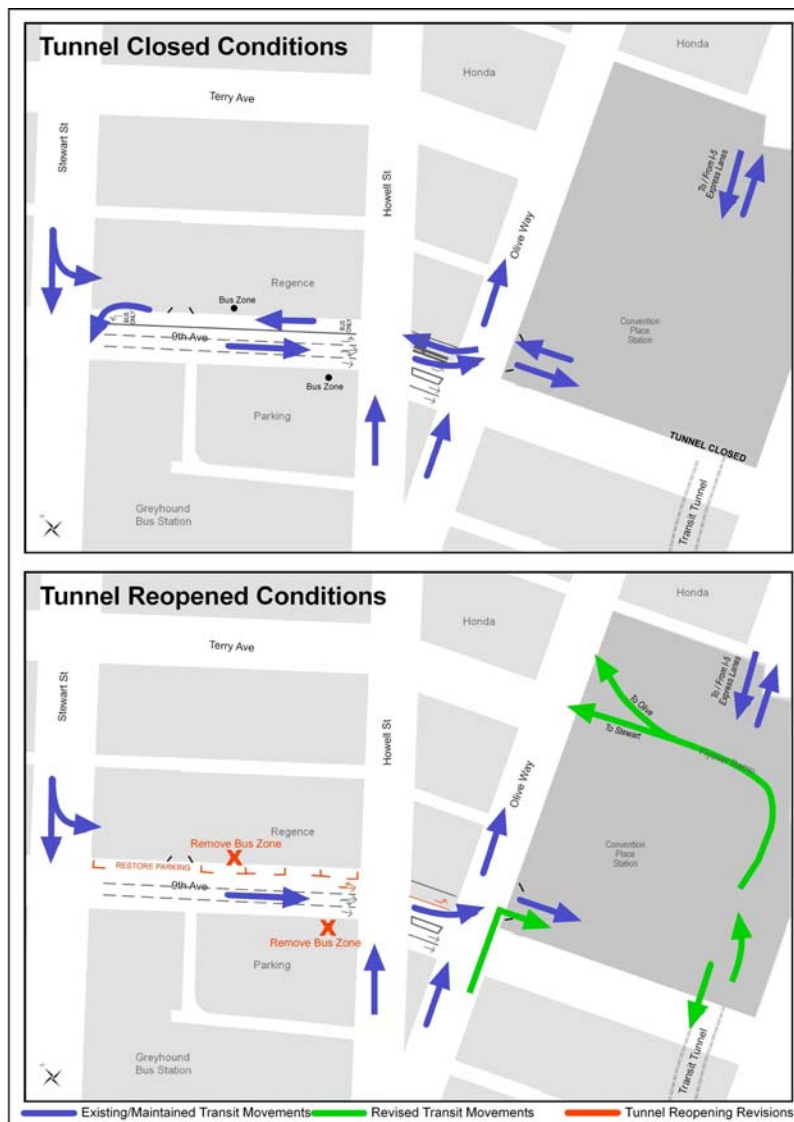
Former peak-only Tunnel routes Remaining on Surface Streets

- 177, 190, 196, & 266 – on 2nd & 4th Avenues
- 306 & 312 – on 2nd & 3rd Avenues

## Ninth Avenue Contraflow Lane

As part of the three party Agreement between the City of Seattle, King County and Sound Transit regarding the Design, Construction, Operation and Maintenance of the Downtown Transit Tunnel, the parties agreed to implement five primary mitigation projects to enhance transit operations on surface streets. The parties agreed to maintain these improvements from the closure of the tunnel for rail retrofit until one year after the initiation of rail service in the tunnel. However, the Agreement did provide a mechanism for the parties to remove a primary mitigation project at an earlier date if it was determined that it would no longer be needed. This was the case with the Ninth Avenue Contra Flow lane for transit. To support tunnel closure, a contra flow lane for transit was created on Ninth Avenue between Olive Way and Stewart. This was needed because buses could not exit the Convention Place staging area during tunnel closure using the normal routing. With the re-opening of the tunnel for bus operation, the Ninth Avenue contra flow lane was no longer needed so Ninth Avenue was restored to a one way southbound street and the on street parking that was previously removed has been restored. See Figure 2 for details on the channelization of this street during and after tunnel closure.

**Figure 2. Ninth Avenue Contraflow Lane Removal**



## **Customer Outreach for September 2007 Service Change**

The September 2007 service change, in conjunction with re-opening of the Downtown Seattle Transit Tunnel, required an intensive effort to inform customers about all the changes in routing and stop assignments. Key statistics that illustrate the magnitude of the outreach effort that was mounted are provided below:

- Metro distributed 75,000 copies of a special Rider Alert Brochure on buses and transit information racks and through Street Teams in downtown Seattle. For a typical service change in February or June, Metro published 25,000 special Rider Alert brochures. The September 2007 brochure included several maps showing all the downtown boarding locations, a route-by-route description of the September changes, a list of boarding locations when the tunnel is closed, and a list of changes along First, Second, Third, Fourth and Fifth avenues.
- After the service change, Metro published 50,000 copies of brochure titled “Welcome Aboard in Downtown Seattle and the Transit Tunnel” that provides a map and guide to help customers get around downtown using the tunnel and service on the street.
- Metro also published 50,000 copies of its annual System Map and Rider’s Guide, which includes a map showing downtown bus service and entrances to the tunnel.
- Metro produced 70 different bus stop Rider Alerts telling customers about bus routes moving either to the tunnel or to Third Avenue. Staff posted the alerts at more than 200 locations in downtown Seattle about two weeks before the service change.
- 2,500 posters were installed in all Metro buses.
- Daily announcements were made over the bus intercom systems in the days leading up to the service change.
- Commute planning sessions were made available at numerous sites throughout downtown Seattle.
- Metro staff from the Rider Information section staffed a satellite site at the former Westlake Tunnel station information kiosk; this temporary office provided directions and transit information to over 500 customers per day.
- A public event at Westlake Park was staged to celebrate the re-opening of the tunnel, to provide transit information and to encourage riders to visit local businesses along the tunnel route.

In addition, nearly 250 employees from the King County Department of Transportation and Sound Transit put in more than 1,000 hours as members of Street Teams in downtown Seattle. The street teaming effort included 454 separate shifts at 54 locations throughout downtown. Street teamers were on the streets morning to night Wednesday through Saturday, September 19-22, and again on Monday, September 24. The street teams handed out information about bus route changes and new timetables, and they answered many questions from customers, such as where to go to enter a tunnel station. Each team member was identified with a vest and cap in Metro colors and the new King County logo.

## **Measure 1: Transit Travel Time**

### **Monitoring Objectives**

The purpose of monitoring transit travel times was to answer the following questions regarding transit travel times in the Seattle downtown core before and after tunnel closure:

- How long are the transit travel times in the Seattle downtown core?
- How consistent are the transit travel times in the Seattle downtown core?
- Where are slowdowns occurring and are there mitigation measures that might address these slowdowns?

### **Methodology**

Transit travel times on surface streets were measured using roadside bus detection equipment at sixteen (16) locations in the Seattle downtown core. The locations of these detection points are identified in Figure 3. A description of the equipment and technology can be found in the methodology section of the Volume 1 Baseline pre-tunnel closure report.

The collection of transit travel times began in summer 2005. Transit travel times have been continuously collected throughout the tunnel closure period. Two levels of data are included in the regular performance reports issued by the Monitor and Maintain Committee:

Level 1: Seattle downtown core summary statistics are the highest level summary. They consist of aggregated travel times through the study area to define an average transit operating time in the Seattle downtown core on surface streets for the AM peak and the PM peak. This measure will show the amount of time a bus takes on average to traverse the downtown area. Considered over time, this measure will give an overall trend of the increase or decrease in delay on surface streets caused by tunnel closure.

Level 2: Transit Corridor Travel Time summary tracked travel time along a discrete set of transit corridors on surface streets in the central business district. The transit corridors included in the monitoring are identified in Figure 2. The data was categorized by corridor and by time of day (AM Peak and PM Peak). Variability of the data was also reported to show the consistency of transit travel times.

Figure 3. Transit Travel Time Summary Analysis Corridors and Detection Point Locations



## Transit Travel Time Comparison

For this report, weekday travel times between October 1, 2007 and November 9, 2007 were used. This period coincided with the fall 2007 service change that went into effect Saturday, September 22nd. This period marked the reopening of the transit tunnel. In addition to many routes returning to the tunnel, several routes were moved from Second Avenue to Third Avenue as part of the implementation of the Transit Blueprint for the Seattle Central Business District (CBD). Also, since the re-opening of the tunnel, there is no longer regular service on Virginia Street that follows the routing previously measured by the downtown transit monitoring system. Consequently, no data was reported for this corridor. Finally, equipment located near Safeco Field experienced communications interference that prevented the collection of northbound First Avenue travel times. Time-of-day periods, monitoring locations and analysis tiers, as described in the previous section, are the same as the baseline report, except where noted.

### Seattle Downtown Core Travel Time Summary (Level 1):

The first level of analysis for downtown transit travel time is a composite measurement of average time spent in the study area. This value is obtained by identifying the first and last observation of a bus trip in the downtown core, regardless of the corridor. Averaging this figure for all trips results in a single value of time spent in the downtown core for all observed trips.

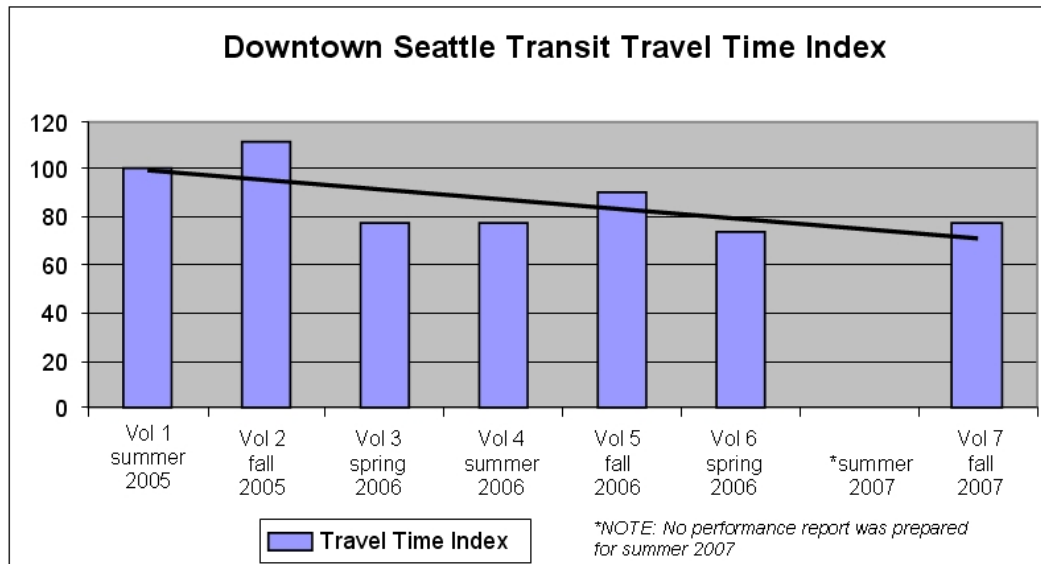
This value is used as an index, not a measure. This figure includes layover time as well as through-routed trips under one measurement. It will also include many different paths through the downtown core with different lengths and travel conditions. The measure becomes meaningful when compared to the same measurement to compare the ease of travel for transit through the downtown core.

The baseline Travel Time Index is **100**, represents the value before tunnel closure. The average travel time value at that time was determined to be 21:59, based on bus trips between 4 - 6 PM on weekdays during the months of July and August, 2005. The data used for this report covers six weeks of the fall 2007 service change. The Travel Time index for this reporting period is **77**, based on an average travel time of 16:53. The current index represents a **23%** decrease in time spent in the downtown core over the baseline, and a **4%** increase over the previous reporting period.

A summary of the travel time indexes from baseline, through tunnel closure and concluding with tunnel reopening is provide in Figure 4.



**Figure 4. Downtown Seattle Travel Time Index**



#### Transit Corridor Travel Time Summaries (Level 2)

The four charts in Figure 5 illustrate the average travel times for transit after tunnel closure on selected corridors. The data for Volume 7 was collected in October and November of 2007 using the monitoring system. The data used is for weekdays only. Each chart shows the average travel time for the direction of travel and time of day indicated. The AM charts include buses observed between 7 – 9 AM at the first reader on the corridor being measured. The PM charts cover the time period from 4 – 6 PM.

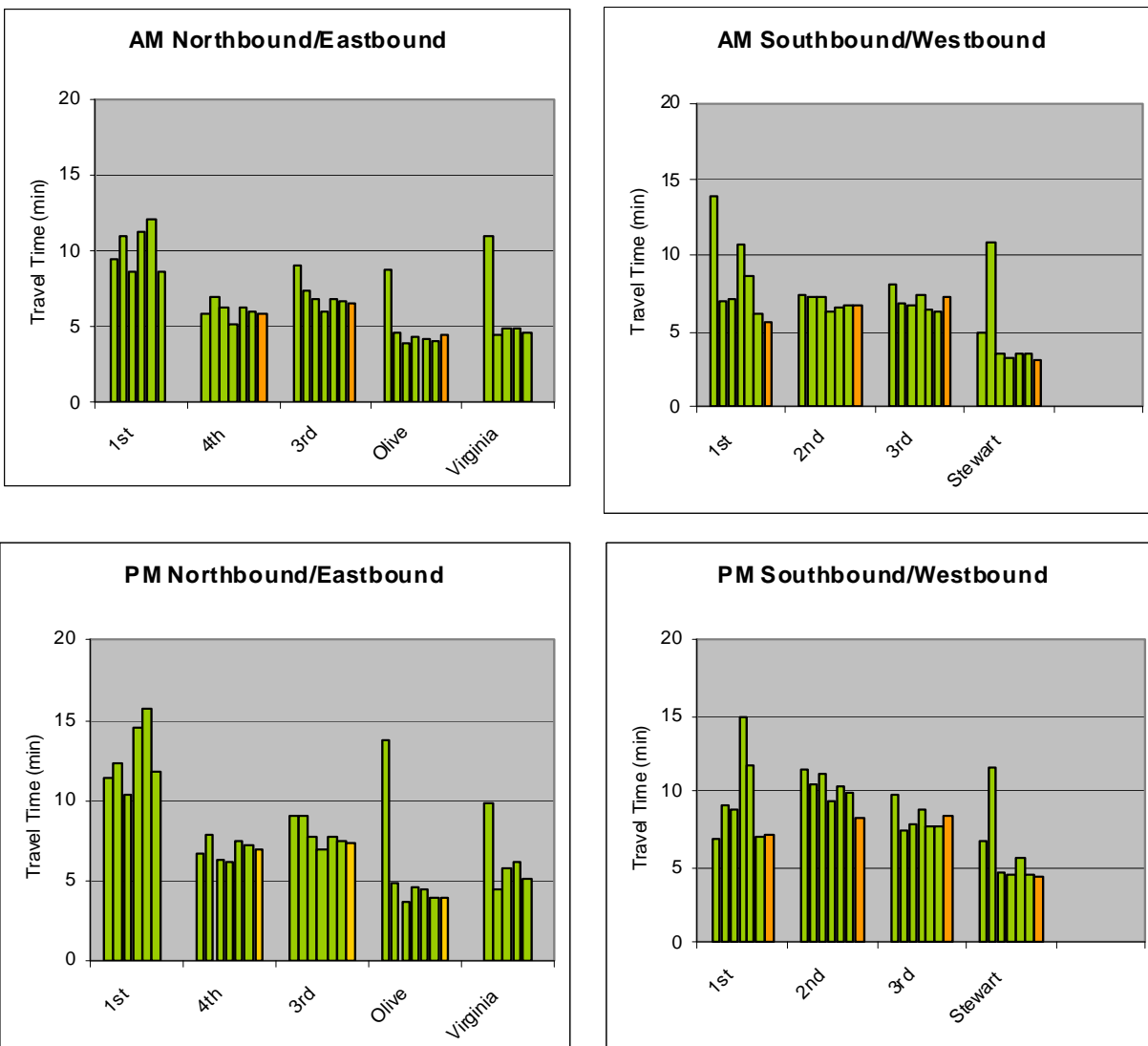
The average corridor travel times in this report are compared to the comparable statistics for both pre-tunnel closure baseline conditions and for the tunnel closure data reported in successive reports. Corridor travel times should not be compared to each other. Readers were placed to ensure route coverage. Readers were also sited to facilitate communications and insure access to power. As a result, the measured corridors differ in length, number of stops and number of signals, all of which affect travel time but are not related to congestion.

The reader locations that define the boundaries of each of the transit corridors are described below along with a table for each corridor that summarizes the Average Travel Time by time period along with the standard deviation (SD) of the observations in minutes. As a statistical measure, approximately 69% of all observations are within one standard deviation of the average. The SD can be interpreted as approximating the range (+/- 1SD) of the typical travel time that a majority of bus riders will experience on the corridor. There are seven data points; Volume 1 pre-tunnel baseline, and Volume 2 through 6 post-tunnel closure observations, and Volume 7 tunnel re-opening.

- Volume 1: Pre-Tunnel Closure Baseline, Data from Summer, 2005
- Volume 2: Post Tunnel Closure, Data from Fall 2005
- Volume 3: Post Tunnel Closure, Data from Spring 2006
- Volume 4: Post Tunnel Closure, Data from Summer 2006
- Volume 5: Post Tunnel Closure, Data from Fall 2006
- Volume 6: Post Tunnel Closure, Data from Spring, 2007
- Volume 7: Tunnel Re-Opening, Data from Fall, 2007

Travel time summaries for all seven data sets are provided in Figure 5 and Figures 6 A through F.

**Figure 5. Transit Corridor Travel Time Comparisons Before and After Tunnel Closure**



*Notes: No data available for northbound First Avenue for Volume 7 tunnel re-opening report.  
No data available for Virginia Street for Volume 7 as routing path that was previously measured was eliminated when tunnel re-opened.*

**Figure 6A. First Avenue Transit Travel Time and Variation**

First Avenue	AM Peak (7 – 9 AM)	PM Peak (4 – 6 PM)
Northbound, Royal Brougham to Seneca Street	Travel time: Baseline – 9 min 22 sec ( <i>SD: 4.8 min</i> ) Volume 2 – 10 min 54 sec ( <i>SD: 5.8 min</i> ) Volume 3 – 8 min 36 sec ( <i>SD:1.8 min</i> ) Volume 4 – 11 min 8 sec ( <i>SD:2.1 min</i> ) Volume 5 – 12 min 6 sec ( <i>SD:2 min</i> ) Volume 6 – 8 min 33 sec ( <i>SD:1.2 min</i> ) Volume 7 – not available Change from Volume 6: n/a	Travel Time: Baseline – 11 min 24 sec ( <i>SD: 5.3 min</i> ) Volume 2 – 12 min 12 sec ( <i>SD:6.0 min</i> ) Volume 3 – 10 min 18 sec ( <i>SD:3 min</i> ) Volume 4 – 14 min 34 sec ( <i>SD:4.3 min</i> ) Volume 5 – 15 min 41 sec ( <i>SD:4 min</i> ) Volume 6 – 11 min 47 sec ( <i>SD:3.2 min</i> ) Volume 7 – not available Change from Volume 6: n/a
Southbound, Seneca Street to Royal Brougham*	Travel time: Baseline – 14 min ( <i>SD: 8.8 min</i> ) Volume 2 – 7 min ( <i>SD: 5.4 min</i> ) Volume 3 – 7 min 8 sec ( <i>SD:1 min</i> ) Volume 4 – 10 min 40 sec ( <i>SD:1.8 min</i> ) Volume 5 – 8 min 39 sec ( <i>SD:1.5 min</i> ) Volume 6 – 6 min 9 sec ( <i>SD:1 min</i> ) Volume 7 – 5 min 37 sec ( <i>SD:1.2 min</i> ) Change from Volume 6: -32 sec	Travel time: Baseline – 6 min 51 sec ( <i>SD: 3.9 min</i> ) Volume 2 – 9 min 6 sec ( <i>SD: 6 min</i> ) Volume 3 – 8 min 49 sec ( <i>SD:1.4 min</i> ) Volume 4 – 14 min 55 sec ( <i>SD:3 min</i> ) Volume 5 – 11 min 42 sec ( <i>SD:3.1 min</i> ) Volume 6 – 7 min 1 sec ( <i>SD:2.4 min</i> ) Volume 7 – 7 min 15 sec ( <i>SD:1.6 min</i> ) Change from Volume 6: +14 sec

**First Avenue** (Northbound and Southbound) reader locations are Royal Brougham to the south and Stewart Street to the north, with a midpoint at Seneca Street. Average travel time and variation in travel time on First Avenue was effectively unchanged in the southbound direction. No northbound data is available for this period due to communications interference within the readers.

**Figure 6B. Second Avenue Transit Travel Time and Variation**

Second Avenue	AM Peak (7 – 9 AM)	PM Peak (4 – 6 PM)
Southbound, Pike Street to S Jackson Street	Travel time: Baseline – 7 min 20 sec ( <i>SD: 1.9 min</i> ) Volume 2 – 7 min 13 sec ( <i>SD: 2.6 min</i> ) Volume 3 – 7 min 11 sec ( <i>SD:1.45 min</i> ) Volume 4 – 6 min 13 sec ( <i>SD:1.5 min</i> ) Volume 5 – 6 min 35 sec ( <i>SD:1.4 min</i> ) Volume 6 – 6 min 47 sec ( <i>SD:1.4 min</i> ) Volume 7 – 6 min 41 sec ( <i>SD:1.4 min</i> ) Change from Volume 6: -6 sec	Travel time: Baseline – 11 min 26 sec ( <i>SD: 4.3 min</i> ) Volume 2 – 10 min 26 sec ( <i>SD: 3.5 min</i> ) Volume 3 – 11 min 10 sec ( <i>SD:2.4 min</i> ) Volume 4 – 9 min 22 sec ( <i>SD:2.2 min</i> ) Volume 5 – 10 min 18 sec ( <i>SD:2.5 min</i> ) Volume 6 – 9 min 55 sec ( <i>SD:2.0 min</i> ) Volume 7 – 8 min 16 sec ( <i>SD:1.8 min</i> ) Change from Volume 6: -1m 39sec

**Second Avenue** (Southbound only) reader locations are Pike Street and S Jackson Street with a midpoint at Seneca Street. Because this measurement is for the entire length of Second Avenue, it does not capture the sometimes significant delays for transit turning right at Columbia Street to access SR99 southbound. Second Avenue travel time remained the same in the AM with no change in variation, and improved by over 90 seconds in the PM with a small decrease in variation. PM Peak improvements are due primarily to the reopening of the bus tunnel, with some routes moving to the tunnel or Third Avenue.

**Figure 6C. Third Avenue Transit Travel Time and Variation**

<b>Third Avenue</b>		<b>AM Peak (7 – 9 AM)</b>	<b>PM Peak (4 – 6 PM)</b>
Northbound, Yesler Way to Stewart Street	Travel time:	Baseline – 9 min (SD: 4.6 min)	Travel Time:
	Volume 2 – 7 min 20 sec (SD: 3.1 min)	Volume 3 – 6 min 53 sec (SD:1.3 min)	Baseline – 9 min 6 sec (SD: n/a)
Southbound, Stewart Street to Yesler Way	Volume 4 – 5 min 53 sec (SD:1.3 min)	Volume 5 – 6 min 43 sec (SD:1.3 min)	Volume 2 – 8 min 57 sec (SD: 3.6 min)
	Volume 6 – 6 min 37 sec (SD:1.2 min)	Volume 7 – 6 min 30 sec (SD:1.4 min)	Volume 3 – 7 min 41 sec (SD:1.3 min)
	Change from Volume 6: -7 sec		Volume 4 – 6 min 53 sec (SD:1.8 min)
	Travel time:	Baseline – 8 min 5 sec (SD: 1.3 min)	Volume 5 – 7 min 47 sec (SD:1.9 min)
	Volume 2 – 6 min 52 sec (SD: 2.8 min)	Volume 3 – 6 min 36 sec (SD:1.6 min)	Volume 6 – 7 min 26 sec (SD:1.6 min)
	Volume 4 – 7 min 17 sec (SD:1.5 min)	Volume 5 – 6 min 26 sec (SD:1.4 min)	Volume 7 – 7 min 17 sec (SD:2.2 min)
	Volume 6 – 6 min 20 sec (SD:1.5 min)	Volume 7 – 7 min 12 sec (SD:1.5 min)	Change from Volume 6: -9 sec
	Change from Volume 6: +52 sec		

**Third Avenue** (Northbound and Southbound) reader locations are Stewart Street to the north and Yesler Way to the south, with a midpoint at Seneca Street. Average travel times in the northbound direction are essentially unchanged from the previous period, with increased variation in the PM peak. Southbound average travel times increased in both peak periods, with variation remaining consistent. Some of the increase in the southbound travel times is due to an increase in the number of routes on the corridor. Travel times in both directions and peak periods are continue to be 1 minute faster or more than the pre-closure conditions.

**Figure 6D. Fourth Avenue Transit Travel Time and Variation**

<b>Fourth Avenue</b>		<b>AM Peak (7 – 9 AM)</b>	<b>PM Peak (4 – 6 PM)</b>
Northbound, S Jackson Street to Seneca Street	Travel time:	Baseline – 5 min 48 sec (SD: 1.2 min)	Travel Time:
	Volume 2 – 6 min 58 sec (SD: 2.8 min)	Volume 3 – 6 min 14 sec (SD:1.35 min)	Baseline – 6 min 46 sec (SD: 1.1 min)
	Volume 4 – 5 min 12 sec (SD:1.2 min)	Volume 5 – 6 min 16 sec (SD:1.3 min)	Volume 2 – 7 min 50 sec (SD: 4 min)
	Volume 6 – 5 min 59 sec (SD:1.1 min)	Volume 7 – 5 min 50 sec (SD:1.2 min)	Volume 3 – 6 min 15 sec (SD:2 min)
	Change from Volume 6: -9 sec		Volume 4 – 6 min 11 sec (SD:2.2 min)
			Volume 5 – 7 min 29 sec (SD:2.8 min)
			Volume 6 – 7 min 9 sec (SD:2.1 min)
			Volume 7 – 6 min 54 sec (SD:2.0 min)
			Change from Volume 6: -15 sec

**Fourth Avenue** (Northbound only) reader locations are Seneca Street to the north and S Jackson Street to the south. Average travel times and variation were essentially unchanged from the previous report.

**Figure 6E. Virginia, Olive Way and Howell Transit Travel Time and Variation**

	<b>AM Peak (7 – 9 AM)</b>	<b>PM Peak (4 – 6 PM)</b>
Eastbound Virginia Street, Third Avenue to Ninth Avenue	Travel time: Baseline – n/a Volume 2 – 10 min 39 sec ( <i>SD: 5.1 min</i> ) Volume 3 – 4 min 23 sec ( <i>SD: .9 min</i> ) Volume 4 – 4 min 53 sec ( <i>SD: .9 min</i> ) Volume 5 – 4 min 53 sec ( <i>SD: 1.0 min</i> ) Volume 6 – 4 min 35 sec ( <i>SD: 1.0 min</i> ) Volume 7 – n/a Change from Volume 6: n/a	Travel Time: Baseline – n/a Volume 2 – 9 min 50 sec ( <i>SD: 4.9 min</i> ) Volume 3 – 4 min 28 sec ( <i>SD: 1 min</i> ) Volume 4 – 5 min 48 sec ( <i>SD: 2.4 min</i> ) Volume 5 – 6 min 11 sec ( <i>SD: 2.7 min</i> ) Volume 6 – 5 min 3 sec ( <i>SD: 2.0 min</i> ) Volume 7 – n/a Change from Volume 6: n/a
Eastbound Olive Way, Third Avenue to Eighth Avenue	Travel time: Baseline – 8 min 42 sec ( <i>SD: 9.1 min</i> ) Volume 2 – 4 min 34 sec ( <i>SD: 2.4 min</i> ) Volume 3 – 3 min 54 sec ( <i>SD: 1 min</i> ) Volume 4 – 4 min 19 sec ( <i>SD: 1 min</i> ) Volume 5 – 4 min 6 sec ( <i>SD: 1.1 min</i> ) Volume 6 – 4 min 5 sec ( <i>SD: 1.3 min</i> ) Volume 7 – 4 min 25 sec ( <i>SD: 1.4 min</i> ) Change from Volume 6: +20sec	Travel Time: Baseline – 13 min 43 sec ( <i>SD: 9.7 min</i> ) Volume 2 – 4 min 51 sec ( <i>SD: 2.5 min</i> ) Volume 3 – 3 min 41 sec ( <i>SD: .9 min</i> ) Volume 4 – 4 min 34 sec ( <i>SD: 1.45 min</i> ) Volume 5 – 4 min 25 sec ( <i>SD: 1.9 min</i> ) Volume 6 – 3 min 57 sec ( <i>SD: 1.8 min</i> ) Volume 7 – 3 min 56 sec ( <i>SD: 1.5 min</i> ) Change from Volume 6: -1 sec
Eastbound Howell Street, Eighth Ave to Yale Street	Travel time: Baseline – 2 min 6 sec ( <i>SD: 1.4 min</i> ) Volume 2 – 3 min 53 sec ( <i>SD: 2.4 min</i> ) Volume 3 – 3 min 23 sec ( <i>SD: 1.6 min</i> ) Volume 4 – 3 min 3 sec ( <i>SD: 1.25 min</i> ) Volume 5 – 3 min 3 sec ( <i>SD: 1.3 min</i> ) Volume 6 – 3 min 19 sec ( <i>SD: 1.3 min</i> ) Volume 7 – 3 min 10 sec ( <i>SD: 1.1 min</i> ) Change from Volume 6: -9 sec	Travel Time: Baseline – 5 min 25 sec ( <i>SD: 3.1 min</i> ) Volume 2 – 5 min 37 sec ( <i>SD: 3.3 min</i> ) Volume 3 – 4 min 50 sec ( <i>SD: 2.3 min</i> ) Volume 4 – 5 min 23 sec ( <i>SD: 2.5 min</i> ) Volume 5 – 5 min 51 sec ( <i>SD: 2.6 min</i> ) Volume 6 – 5 min 21 sec ( <i>SD: 2.9 min</i> ) Volume 7 – 5 min 56 sec ( <i>SD: 2.2 min</i> ) Change from Volume 6: +35 sec

**Virginia Street** (Eastbound only) reader locations are Third Avenue at Stewart Street to the west and Ninth Avenue at Stewart Street to the east. There was no transit service on Virginia Street before the tunnel closure, so there is no baseline data. With the reopening of the Transit Tunnel, there is no longer transit service following the routing used during tunnel closure, so there is no data to report.

**Olive Way** (Eastbound only) reader locations are Third Avenue to the west and Eighth Avenue to the east. Average travel times were 20 seconds longer in the AM peak from the previous report, with little change in variation. Average travel time in the PM peak was the same as the previous period with an improvement in variation.

**Howell Street** (Eastbound only): Transit on Howell Street east of Eighth Avenue was slightly faster in the AM peak and 30 seconds slower in the PM peak as compared to the previous reporting period with slight improvements in variation in both peak periods. PM Peak average travel times matched observations from the same period in 2006.

**Figure 6F. Stewart Street Transit Travel Time and Variation**

	<b>AM Peak (7 – 9 AM)</b>	<b>PM Peak (4 – 6 PM)</b>
Westbound, Ninth Avenue to Third Avenue	Travel time:	Travel Time:
	Baseline – 4 min 50 sec ( <i>SD: 1.9 min</i> )	Baseline – 6 min 42 sec ( <i>SD: 1.5 min</i> )
	Volume 2 – 10 min 52 sec ( <i>SD: 5.2 min</i> )	Volume 2 – 11 min 36 sec ( <i>SD: 4.9 min</i> )
	Volume 3 – 3 min 31 sec ( <i>SD: 1 min</i> )	Volume 3 – 4 min 42 sec ( <i>SD: 2 min</i> )
	Volume 4 – 3 min 8 sec ( <i>SD: 1.5 min</i> )	Volume 4 – 4 min 32 sec ( <i>SD: 2.5 min</i> )
	Volume 5 – 3 min 32 sec ( <i>SD: 1.05 min</i> )	Volume 5 – 5 min 40 sec ( <i>SD: 3.3 min</i> )
	Volume 6 – 3 min 27 sec ( <i>SD: 0.9 min</i> )	Volume 6 – 4 min 34 sec ( <i>SD: 2.2 min</i> )
	Volume 7 – 3 min 3 sec ( <i>SD: 0.8 min</i> )	Volume 7 – 4 min 23 sec ( <i>SD: 2.9 min</i> )
	<i>Change from Volume 6: -24 sec</i>	<i>Change from Volume 6: -11 sec</i>

**Stewart Street** (Westbound only) reader locations are Third Avenue to the west and Ninth Avenue to the east. Average travel time improved slightly in both the peak periods. Variation in the PM Peak increased by about 30%.

### Summary Conclusions

Based on the trends in the travel time indexes and the corridor specific travel time data, the following conclusions can be made:

- Transit improvements reduced surface travel times by roughly one fourth, while accommodating more than 100 additional trips displaced from the tunnel per hour.
- Third Avenue peak period restrictions improved transit travel time on that corridor by one to two minutes depending on time of day, while accommodating almost 100 additional trips per hour
- A seasonal trend appears to exist where fall travel times are slower than spring and summer travel times.
- Maintaining the transit improvements with the return of transit service volumes to the tunnel appears to have offset most of the fall seasonal increase in travel time, while improving Second Avenue travel times by more than one and a half minutes in the critical PM Peak.

## **Measure 2: General Purpose Traffic Operations**

### **Monitoring Objectives**

The City of Seattle measured downtown traffic conditions before and during tunnel closure and after tunnel re-opening to assess the impacts of tunnel closure on general purpose traffic operations. Where problems were observed, data was used to help identify corrective actions.

Traffic data were collected in January 2005 (before tunnel closure), October 2005 and May 2006 (during tunnel closure), and October/November 2007 (after tunnel re-opening). This chapter highlights key observations on general purpose traffic operations and summarizes the data collected.

### **Methodology**

The City of Seattle collected three sets of data to evaluate the effect of tunnel closure on downtown traffic operations:

1. **Travel time studies:** The City of Seattle conducted studies to assess changes in travel time for general traffic on key downtown corridor segments on First Avenue, Second Avenue, Fourth Avenue, Fifth Avenue, Stewart Street, Olive Way, Pike Street, Spring Street and Cherry Street. The City used a “floating car” travel time method, in which a probe car is driven along each route and the driver records the time it takes to traverse the route moving within the flow of general traffic. Data was collected during the AM peak period (7-9 AM), mid-day or off-peak period (1-3 PM), and PM peak period (4-6 PM). In most cases, the reported travel times are the average of 5-10 travel time “runs” by a single car during each time period on a single day and may reflect unique traffic conditions.
2. **Traffic volume (“tube”) counts:** The City of Seattle collected traffic volume data at selected locations through downtown using pneumatic tubes. These automated counting machines typically count all vehicles at each location for a full week, and data are summarized to provide hourly and daily directional volumes. Key measures reported in this chapter are Average Weekday Daily Traffic based on 5 weekdays (AWDT) and AWDT PM Peak Hour volume based on the highest volume weekday PM hour at each location. During the 2007 data collection, pneumatic tubes were damaged at the following locations, and no data are available for this report: Second/Pike, Second/Pine, Sixth/University, Spring/Third, and University/Third.
3. **Turning movement counts:** The City of Seattle counted turning movements at 23 intersections. Data gatherers directly observe and record traffic and turning movement activity for one hour during the AM peak period, mid-day or off-peak period, and PM peak period. As with the travel time studies, these data are typically collected on a single day and may reflect unique traffic conditions. Turning movement counts are usually used to troubleshoot and resolve traffic problems observed in the field (rather than to identify traffic problems).

### **Key Observations**

Traffic operations data collected before, during, and after tunnel closure are summarized at the end of this chapter. Key observations are summarized below.

#### Downtown Travel Times

During the AM peak period:

- Travel times on northbound and southbound First Avenue and eastbound Spring Street increased after tunnel re-opening, but are less than pre-tunnel closure travel times.

- Travel times on eastbound Olive Way, which decreased substantially after tunnel closure, continued to increase and are now approaching pre-tunnel closure levels.
- Travel times decreased after tunnel re-opening on northbound Fourth Avenue, southbound Fifth Avenue, westbound Stewart Street, and eastbound Cherry Street.

During the mid-day or off-peak period:

- Travel times increased on northbound Fourth Avenue and southbound Fifth Avenue.
- Travel times on most other corridors have decreased or have remained at or near pre-tunnel closure levels.

During the PM peak period:

- Travel times increased substantially on northbound Fourth Avenue between Royal Brougham Way and South Washington Street, and between James Street and Olive Way. On the day that travel times were collected on this corridor, travel times were significantly higher after 5:15 PM; travel times earlier in the PM peak were closer to earlier studies. This increase may be a function of the specific days the survey was conducted.
- Travel times increased substantially on eastbound Spring Street. The City recently adjusted parking restrictions on Spring Street that may have contributed to this congestion.
- Travel times on southbound Second Avenue remained well below pre-tunnel closure levels, and travel times decreased substantially on eastbound Cherry Street.

#### Traffic Volumes and Turning Movements

- PM peak and daily traffic volumes on northbound and southbound Third Avenue decreased at all locations from pre-tunnel closure levels due to peak period traffic restrictions on Third.
- Decreased traffic volumes on Third Avenue were not clearly reflected as increased traffic volumes on other corridors. In fact, PM peak volumes decreased by more than 100 vehicles per hour on southbound Second Avenue and northbound Fourth Avenue.
- Increased PM peak volumes of more than 100 vehicles per hour were observed at only a few locations: on northbound Sixth Avenue and westbound Stewart Street.
- Turning movement counts showed significant increases in volume for the following intersection movements:
  - First/Columbia westbound through, southbound through, northbound left, and northbound through in the AM and PM peaks.
  - First/Spring northbound through in the AM peak.
  - Second/University southbound left and southbound through in the AM, mid-day, and PM peak periods.

#### **Summary of Data Collected**

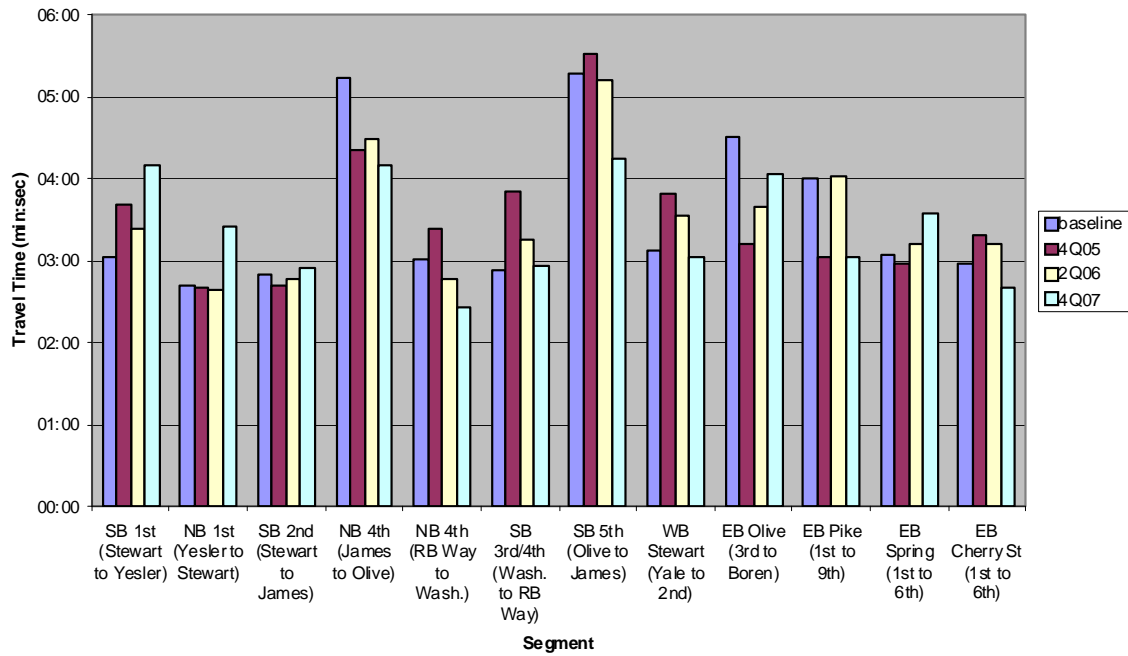
Figure 7A (AM peak), Figure 7B (mid-day), and Figure 7C (PM peak) summarize travel times on downtown corridors before and during tunnel closure, and after tunnel re-opening.

Figure 8A summarizes traffic volume counts at selected downtown locations before and during tunnel closure, and after tunnel re-opening. Figure 8B summarizes the changes in traffic volumes between before tunnel closure counts, and counts conducting during tunnel closure and after tunnel re-opening.

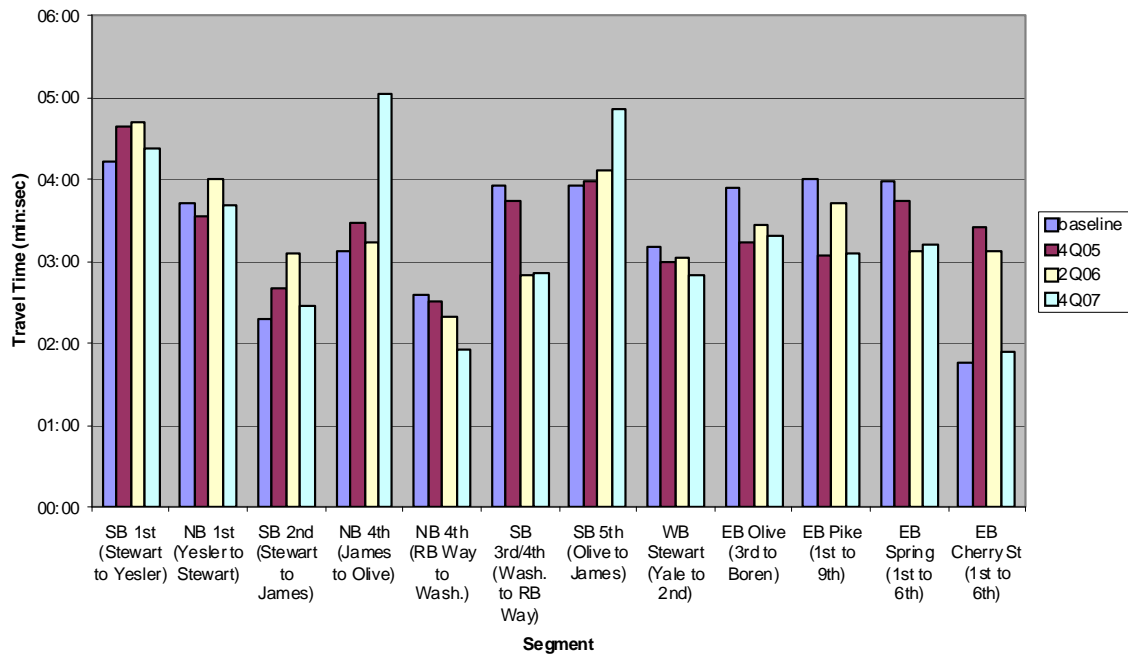
Tables summarizing turning movement counts at 23 downtown intersections before and during tunnel closure, and after tunnel re-opening are not printed in this report, but are available upon request.



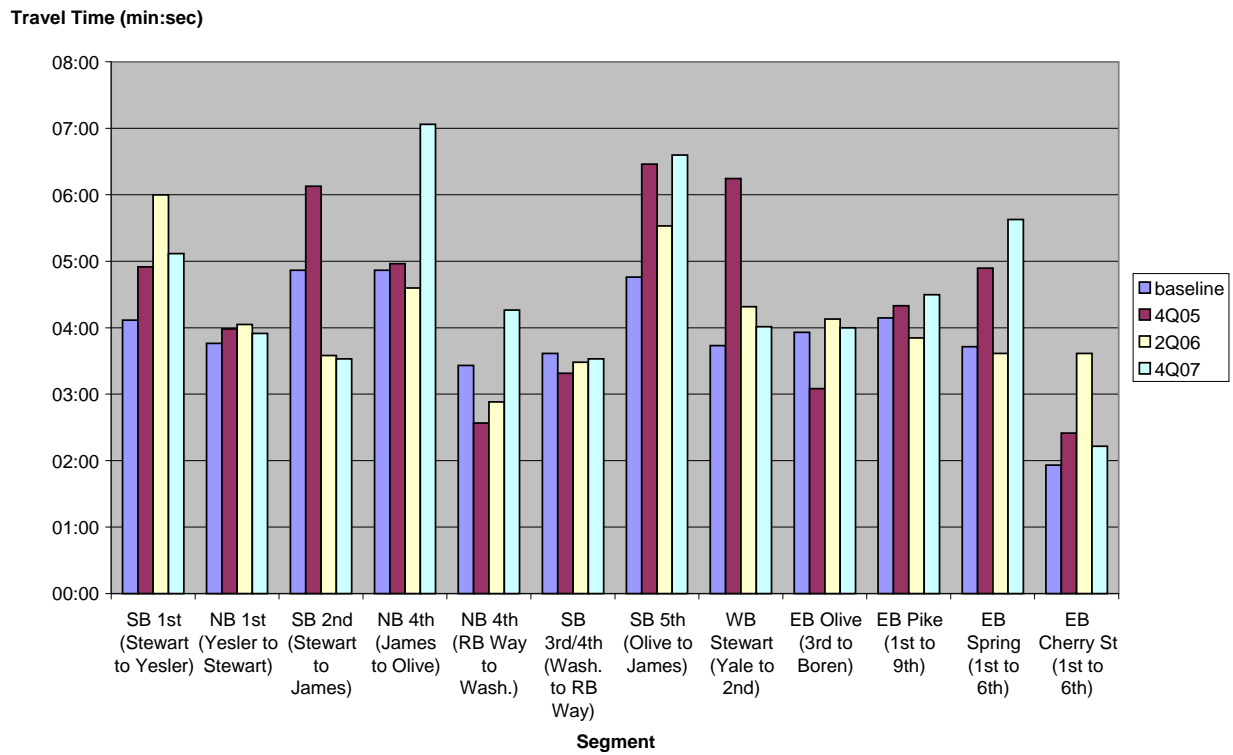
**Figure 7A. General Purpose Travel Time AM Peak (7-9 AM)**



**Figure 7B. General Purpose Travel Time Off Peak (1-3 PM)**



**Figure 7C. General Purpose Travel Time PM Peak (4 - 6 PM)**



**Figure 8A. Average Daily and PM Peak Traffic Volumes**

Location	Direction of Flow	Jan-05		Oct-05		May-06		Oct-07	
		PM Peak Hour	AWDT*	PM Peak Hour	AWDT*	PM Peak Hour	AWDT*	PM Peak Hour	AWDT*
1ST AVE, NW/O CHERRY ST	South	610	6,645	436	6,467	652	6,502	674	6,700
1ST AVE, NW/O SPRING ST	South	797	10,211	790	10,123	814	10,122	747	10,004
2ND AVE, NW/O PIKE ST	South	1,339	16,831	1,232	15,333	1,394	17,536	na	na
2ND AVE, NW/O PINE ST	South	1,174	14,441	1,381	17,569	1,349	16,427	na	na
2ND AVE, NW/O VIRGINIA ST	South	1,038	12,429	990	13,013	753	12,021	907	12,743
3RD AVE, NW/O LENORA ST	South	316	3,749	228	3,131	262	3,421	258	3,460
3RD AVE, NW/O PINE ST	South	447	4,684	296	3,612	287	3,630	303	3,963
3RD AVE, NW/O STEWART ST	South	356	4,095	260	3,331	276	3,388	284	3,808
3RD AVE, NW/O VIRGINIA ST	South	376	4,450	259	3,473	279	3,409	319	4,031
3RD AVE, SE/O JAMES ST	South	459	4,286	260	3,132	261	3,194	235	2,907
3RD AVE, SE/O UNION ST	South	478	6,297	358	4,282	335	4,062	326	4,299
5TH AVE S, N/O S JACKSON ST	South	600	5,626	640	6,497	588	6,387	474	5,316
5TH AVE S, N/O S MAIN ST	South	561	5,590	572	6,171	583	6,413	447	5,225
5TH AVE S, S/O S WELLER ST	South	611	5,094	583	5,670	554	5,610	440	4,688
WESTERN AVE, NW/O YESLER WAY	South	262	2,301	256	2,304	277	2,473	246	2,328
1ST AVE, SE/O COLUMBIA ST	North	550	7,430	593	7,968	587	8,115	551	8,065
1ST AVE, SE/O SENECA ST	North	677	7,661	775	8,403	728	8,291	758	8,717
3RD AVE, SE/O BLANCHARD ST	North	630	5,358	338	4,091	325	3,984	336	4,043
3RD AVE, SE/O JAMES ST	North	405	4,871	341	4,275	333	4,270	303	4,025
3RD AVE, SE/O LENORA ST	North	692	6,189	391	4,829	406	5,022	386	4,891
3RD AVE, SE/O STEWART ST	North	692	6,667	396	5,550	381	5,174	102	1,417
3RD AVE, SE/O UNION ST	North	515	6,164	359	4,690	355	4,508	366	4,329
3RD AVE, SE/O VIRGINIA ST	North	655	5,901	335	4,751	337	4,611	302	4,153
4TH AVE S, S/O S JACKSON ST	North	1,218	13,926	1,041	12,068	1,093	12,379	983	12,172
4TH AVE, SE/O CHERRY ST	North	1,784	18,833	1,820	19,000	1,718	18,863	1,608	17,588
4TH AVE, SE/O JAMES ST	North	1,523	15,698	1,554	16,456	1,461	15,715	1,525	16,447
4TH AVE, SE/O UNION ST	North	1,808	19,236	1,900	20,383	1,827	19,446	1,799	19,316
5TH AVE S, S/O S WELLER ST	North	86	1,144	155	1,814	128	1,590	119	1,490
6TH AVE, SE/O OLIVE WAY	North	1,055	12,618	1,254	14,644	1,111	13,196	1,160	14,155
6TH AVE, SE/O UNIVERSITY ST	North	1,026	15,102	1,194	16,332	1,151	16,237	1,150	16,659
WESTERN AVE, SE/O COLUMBIA ST	North	208	1,587	211	1,637	201	1,662	206	1,710
CHERRY ST, SW/O 3RD AVE	East	548	5,100	547	5,255	728	8,490	516	4,991
JAMES ST, SW/O 3RD AVE	East	313	2,759	363	3,115	360	3,005	322	2,827
SPRING ST, SW/O 3RD AVE	East	747	7,885	721	7,814	587	5,481	700	8,600
UNIVERSITY ST, SW/O 3RD AVE	East	445	5,626	507	6,508	484	6,369	500	6,648
JAMES ST, NE/O 2ND AVE	West	282	4,049	290	4,002	291	4,055	269	3,901
LENORA ST, NE/O 2ND AVE	West	440	4,463	404	4,620	419	4,558	410	4,571
PINE ST, NE/O 2ND AVE	West	424	5,330	410	5,602	494	6,203	417	5,863
STEWART ST, NE/O 2ND AVE	West	626	7,191	723	8,379	652	7,871	773	8,907
STEWART ST, NE/O 4TH AVE	West	785	10,869	819	11,756	772	11,302	715	10,196

\* AWDT = Average Weekday Daily Traffic (based on 5 weekdays)

**Figure 8B. Changes in Average Daily and PM Peak Traffic Volumes**

Location	Direction of Flow	Oct-05 to Jan-05				Oct-05 to May-06				Oct-05 to Oct-07			
		PM Peak Hour		AWDT*		PM Peak Hour		AWDT*		PM Peak Hour		AWDT*	
		Total Change	% Change	Total Change	% Change	Total Change	% Change	Total Change	% Change	Total Change	% Change	Total Change	% Change
1ST AVE, NW/O CHERRY ST	South	-174	-29%	-178	-3%	42	7%	-143	-2%	64	10%	55	1%
1ST AVE, NW/O SPRING ST	South	-7	-1%	-88	-1%	17	2%	-89	-1%	-50	-6%	-207	-2%
2ND AVE, NW/O PIKE ST	South	-107	-8%	-1,498	-9%	55	4%	705	4%	na	na	na	na
2ND AVE, NW/O PINE ST	South	207	18%	3,128	22%	175	15%	1,986	14%	na	na	na	na
2ND AVE, NW/O VIRGINIA ST	South	-48	-5%	584	5%	-285	-27%	-408	-3%	-131	-13%	314	3%
3RD AVE, NW/O LENORA ST	South	-88	-28%	-618	-16%	-54	-17%	-328	-9%	-58	-18%	-289	-8%
3RD AVE, NW/O PINE ST	South	-151	-34%	-1,072	-23%	-160	-36%	-1,054	-23%	-144	-32%	-721	-15%
3RD AVE, NW/O STEWART ST	South	-96	-27%	-764	-19%	-80	-22%	-707	-17%	-72	-20%	-287	-7%
3RD AVE, NW/O VIRGINIA ST	South	-117	-31%	-977	-22%	-97	-26%	-1,041	-23%	-57	-15%	-419	-9%
3RD AVE, SE/O JAMES ST	South	-199	-43%	-1,154	-27%	-198	-43%	-1,092	-25%	-224	-49%	-1,379	-32%
3RD AVE, SE/O UNION ST	South	-120	-25%	-2,015	-32%	-143	-30%	-2,235	-35%	-152	-32%	-1,998	-32%
5TH AVE S, N/O S JACKSON ST	South	40	7%	871	15%	-12	-2%	761	14%	-126	-21%	-310	-6%
5TH AVE S, N/O S MAIN ST	South	11	2%	581	10%	22	4%	823	15%	-114	-20%	-365	-7%
5TH AVE S, S/O S WELLS ST	South	-28	-5%	576	11%	-57	-9%	516	10%	-171	-28%	-406	-8%
WESTERN AVE, NW/O YESLER WAY	South	-6	-2%	3	0%	15	6%	172	7%	-16	-6%	27	1%
1ST AVE, SE/O COLUMBIA ST	North	43	8%	538	7%	37	7%	685	9%	1	0%	635	9%
1ST AVE, SE/O SENECA ST	North	98	14%	742	10%	51	8%	630	8%	81	12%	1,056	14%
3RD AVE, SE/O BLANCHARD ST	North	-292	-46%	-1,267	-24%	-305	-48%	-1,374	-26%	-294	-47%	-1,315	-25%
3RD AVE, SE/O JAMES ST	North	-64	-16%	-596	-12%	-72	-18%	-601	-12%	-102	-25%	-846	-17%
3RD AVE, SE/O LENORA ST	North	-301	-44%	-1,360	-22%	-286	-41%	-1,167	-19%	-306	-44%	-1,298	-21%
3RD AVE, SE/O STEWART ST	North	-296	-43%	-1,117	-17%	-311	-45%	-1,493	-22%	-590	-85%	-5,250	-79%
3RD AVE, SE/O UNION ST	North	-156	-30%	-1,474	-24%	-160	-31%	-1,656	-27%	-149	-29%	-1,835	-30%
3RD AVE, SE/O VIRGINIA ST	North	-320	-49%	-1,150	-19%	-318	-49%	-1,290	-22%	-353	-54%	-1,748	-30%
4TH AVE S, S/O S JACKSON ST	North	-177	-15%	-1,858	-13%	-125	-10%	-1,547	-11%	-235	-19%	-1,754	-13%
4TH AVE, SE/O CHERRY ST	North	36	2%	167	1%	-66	-4%	30	0%	-176	-10%	-1,245	-7%
4TH AVE, SE/O JAMES ST	North	31	2%	758	5%	-62	-4%	17	0%	2	0%	749	5%
4TH AVE, SE/O UNION ST	North	92	5%	1,147	6%	19	1%	210	1%	-9	0%	80	0%
5TH AVE S, S/O S WELLS ST	North	69	81%	670	59%	42	49%	446	39%	33	38%	346	30%
6TH AVE, SE/O OLIVE WAY	North	199	19%	2,026	16%	56	5%	578	5%	105	10%	1,537	12%
6TH AVE, SE/O UNIVERSITY ST	North	168	16%	1,230	8%	125	12%	1,135	8%	124	12%	1,557	10%
WESTERN AVE, SE/O COLUMBIA ST	North	3	1%	50	3%	-7	-3%	75	5%	-2	-1%	123	8%
CHERRY ST, SW/O 3RD AVE	East	-1	0%	155	3%	180	33%	3,390	66%	-32	-6%	-109	-2%
JAMES ST, SW/O 3RD AVE	East	50	16%	356	13%	47	15%	246	9%	9	3%	68	2%
SPRING ST, SW/O 3RD AVE	East	-26	-3%	-71	-1%	-160	-21%	-2,404	-30%	-47	-6%	715	9%
UNIVERSITY ST, SW/O 3RD AVE	East	62	14%	882	16%	39	9%	743	13%	55	12%	1,022	18%
JAMES ST, NE/O 2ND AVE	West	8	3%	-47	-1%	9	3%	6	0%	-13	-5%	-148	-4%
LENORA ST, NE/O 2ND AVE	West	-36	-8%	157	4%	-21	-5%	95	2%	-30	-7%	108	2%
PINE ST, NE/O 2ND AVE	West	-14	-3%	272	5%	70	17%	873	16%	-7	-2%	533	10%
STEWART ST, NE/O 2ND AVE	West	97	16%	1,188	17%	26	4%	680	9%	147	23%	1,716	24%
STEWART ST, NE/O 4TH AVE	West	34	4%	887	8%	-13	-2%	433	4%	-70	-9%	-673	-6%

\* AWDT = Average Weekday Daily Traffic (based on 5 weekdays)

## **Measure 3: Transit Ridership and Bus Volumes**

### **Monitoring Objectives**

The purpose of monitoring transit passenger and bus volumes was as follows:

- Provide data on bus volumes by street segment in downtown Seattle
- Measure the average weekday PM peak hour and weekday passenger loads crossing the Seattle CBD north-south screen line
- Provide data as available from Community Transit and Pierce Transit on average ridership crossing the north-south screen line during average PM peak hours and weekdays
- Identify and analyze any substantive changes in ridership or bus volumes for before and after tunnel closure conditions

### **Methodology**

Baseline bus volumes used for this analysis were extracted from HASTUS - the King County Metro scheduling system - using the February 2005 service change. These counts included in-service as well as out of service coaches. A projection of bus volumes on downtown streets for after tunnel closure conditions for September 2006 was also issued with Volume 1, the Baseline Report. These projected bus volumes have subsequently been compared with actual bus volumes for all service changes that have occurred since tunnel closure. Volume 2 provided a comparison with bus volumes as of December 2005 that reflected routing adjustments made to address operating impacts on Stewart Street. Volume 3 provided a comparison with bus volumes from the February 2006 service changes. Volume 4 provided a comparison with bus volumes as of June 2006. Volume 5 provided a comparison with bus volumes as of the September 2006. With Volume 6, the comparison was with bus volumes from the February 2007 service change. For Volume 7, the relevant comparison is bus volumes on downtown streets before tunnel closure and after tunnel re-opening. Re-opening of the tunnel was accompanied not only by the re-assignment of routes back to the tunnel bus also the reassignment of routes on the surface streets to fully utilize the capacity of the Third Avenue made possible by the continuation of peak hour traffic restrictions.

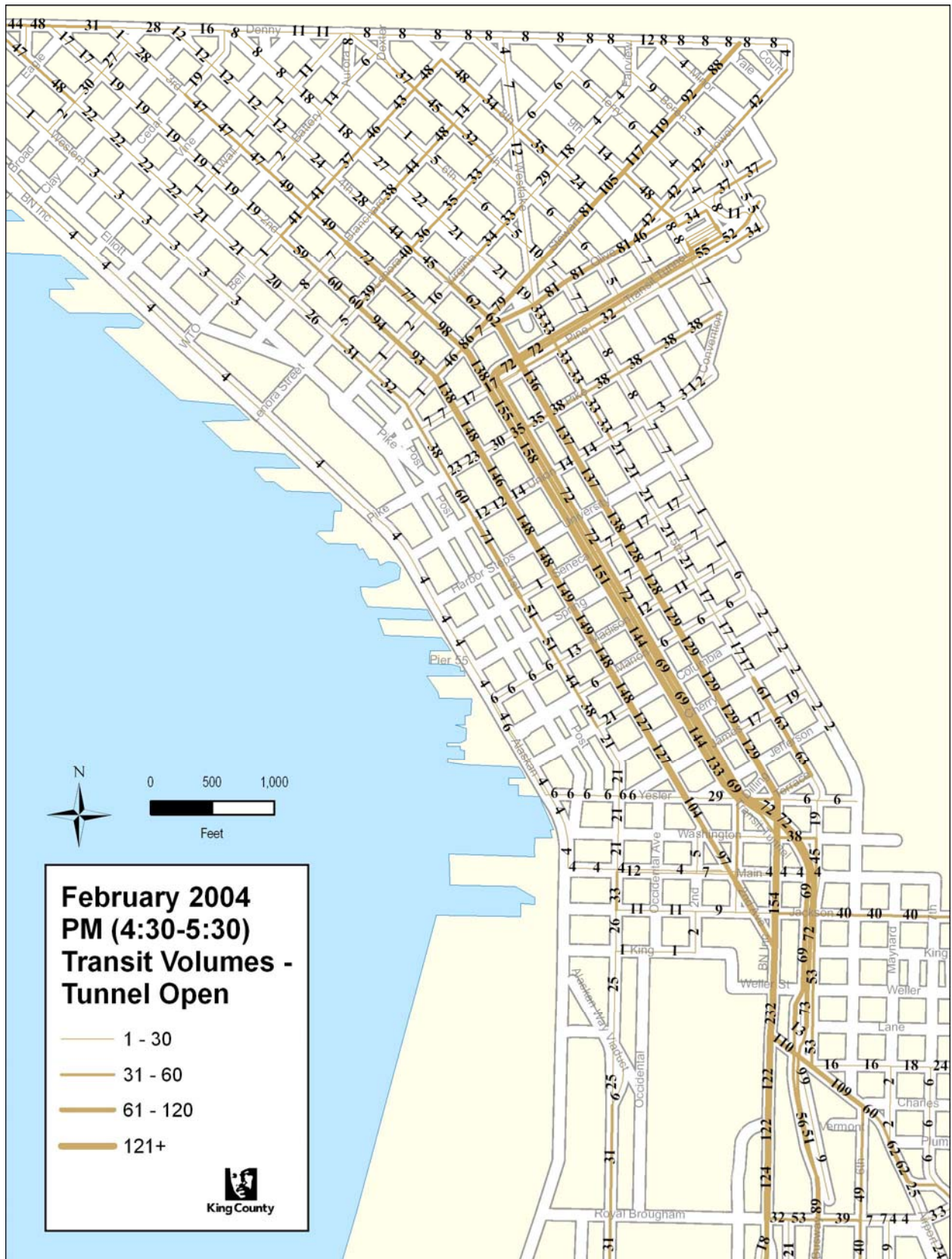
For passenger loads, the Automated Passenger Count (APC) system is the primary source for passenger data for Metro coaches. APC data is collected in a random sample during each signup, downloaded and processed monthly. This data is summarized in a final form at the end of each signup. Preliminary data, based on smaller samples, is available monthly. Metro driver count data is collected on an ad hoc basis when preliminary APC results indicate that observations of trips on a particular route will fall below an adequate sample. Ridership data on Community Transit and Pierce Transit service is generated by the monitor reports supplied by each of these agencies. The ridership data from Community Transit and Pierce Transit is available by signup at the aggregate level.

APC data, supplemented by driver counts and estimates for any non-APC observed trips, was used to estimate pre-tunnel closure Metro ridership volumes crossing the screen line just south of University Street by trip during the PM peak hour and the average weekday. These results were been summarized by street and by direction and have subsequently been used to assess changes in ridership volumes and loads since tunnel closure.

### **Bus Volumes**

Bus volumes before tunnel closure as of February 2004 are shown in Figure 9A. Average bus volumes during tunnel closure are shown in Figure 9B. The actual post tunnel bus volumes for downtown streets as of February 2008 service change are shown in Figure 9C. Peak hour tunnel utilization is slightly reduced from the period before tunnel closure but overall all day utilization is approximately the same due to the assignment of more all day routes to the tunnel. The utilization of Third Avenue has been maintained at or close to the levels achieved during tunnel closure by reassigning routes that formerly operated on First, Second, Fourth, and Fifth Avenues to Third Avenue. These shifts have resulted in a significant reduction in bus volumes on Second, Fourth, and Fifth Avenues.

Figure 9A. PM Peak Hour Transit Volumes, February 2004 - Pre-Tunnel Closure Baseline Report





**Figure 9B. Average PM Peak Hour Transit Volumes during Tunnel Closure**

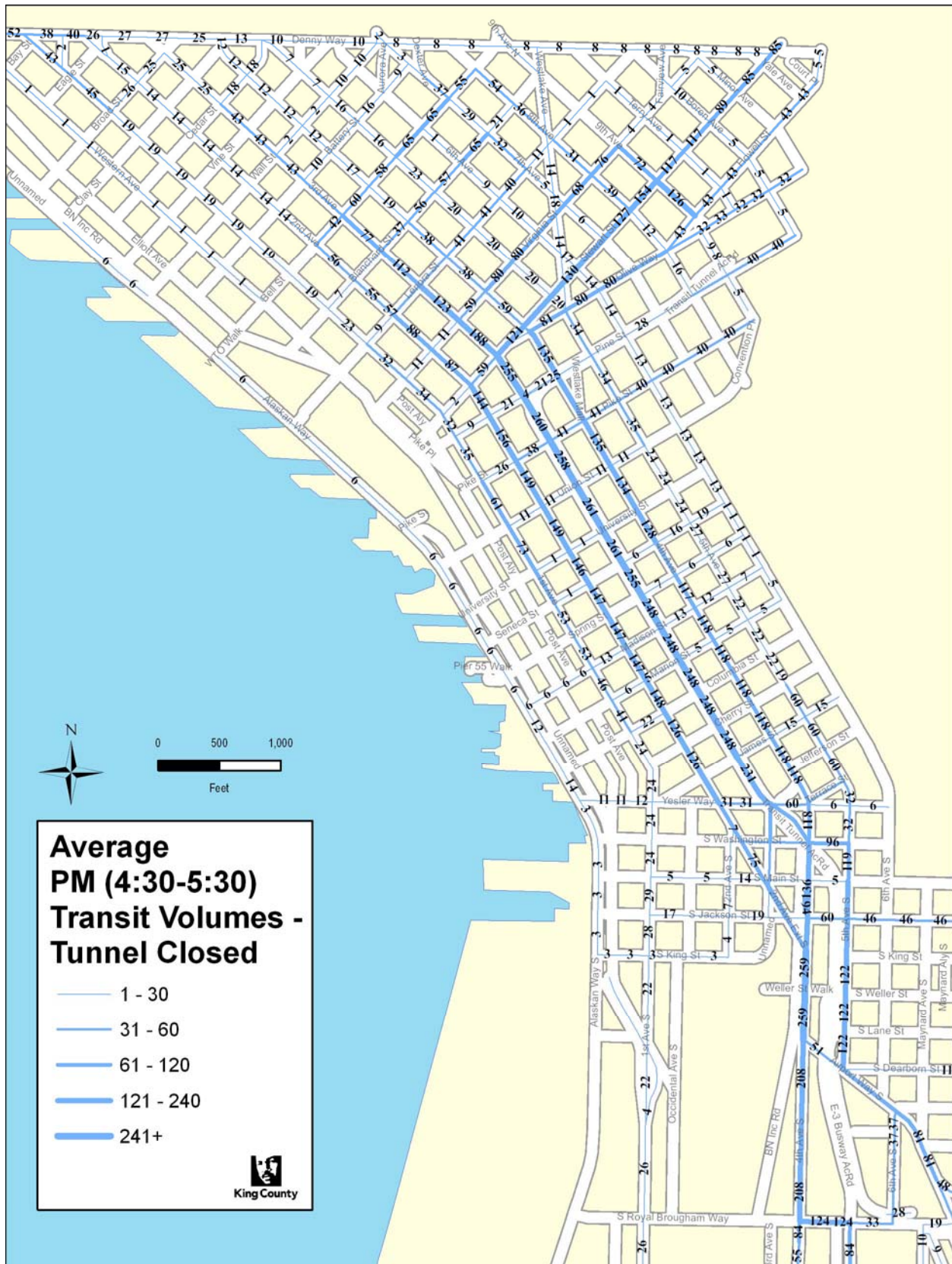
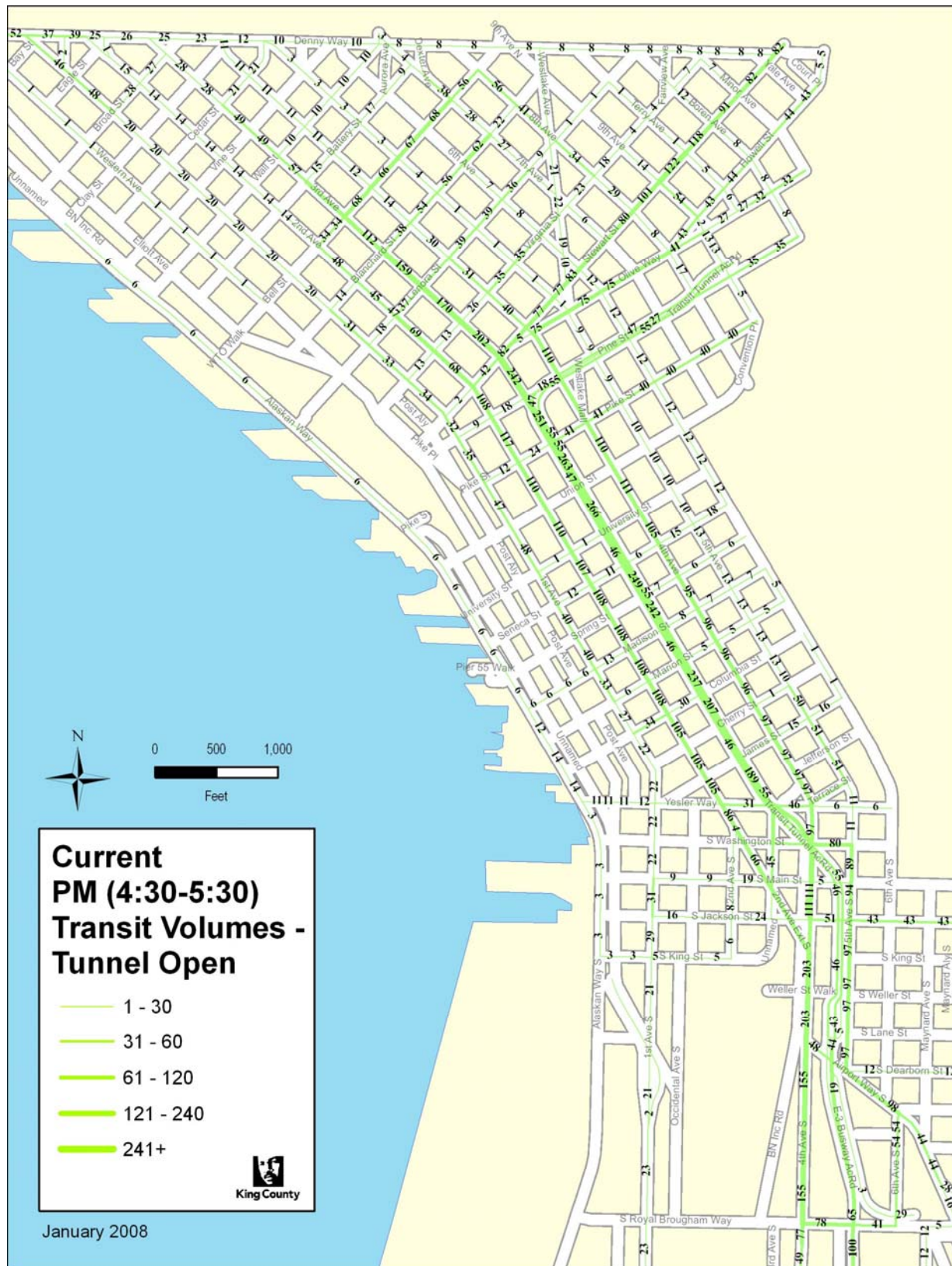


Figure 9C. Current (January 2008) PM Peak Hour Transit Volumes after Tunnel Re-opening





## Transit Ridership Volumes

Prior to tunnel closure, the primary concern regarding ridership was that ridership on transit trips entering the CBD might exceed the available capacity, leading to unacceptable overloads. To address this concern, University Street, approximately in the middle of the CBD, was established as a screenline, and the total volume of riders crossing this screenline, regardless of origin or destination, was measured for pre-closure baseline conditions, and for post-closure conditions. It has also been measured for tunnel re-opening conditions in 2007.

Approximately 95,000 north-south riders crossed the downtown screenline at University Street on weekdays in fall 2004 before tunnel closure. As part of a general increase in ridership, this number increased to almost 106,700 weekday riders in spring 2005. Ridership in spring 2007, just before tunnel re-opening was almost three percent higher than spring 2005, at 109,400 weekday riders. Preliminary data for fall 2007 suggest that loads crossing University Street after tunnel re-opening rose to over 115,000 weekday riders as of October and November. This increase was expected, since tunnel re-opening meant travel times across the CBD have decreased, encouraging more ride free area trips.

Figure 10 compares fall 2007 ridership on King County Metro routes at University Street with loads at University Street in spring 2005, before tunnel closure, and loads at University Street in spring 2007, before tunnel re-opening. Average weekday loads increased by approximately 5 percent after tunnel re-opening, and were 8 percent higher than in spring 2005. Loads crossing the screenline in just the tunnel in both directions increased by about 5 percent. The total load crossing the screenline during the peak hour from 4:30 to 5:30 PM increased by about 22 percent after tunnel re-opening, when compared to spring 2007, bearing out predictions of a latent demand for cross-CBD trips that had been suppressed by tunnel closure.

Since tunnel re-opening was accompanied by the reassignment of additional routes to Third Avenue, as well as the assignment of routes into the tunnel, all of the avenues except Third saw significant decreases in the Amount of load crossing the screenline.

**Figure 10. Passenger Loads at University Street, before Tunnel Closure (spring 2005), during Tunnel Closure (spring 2007), and after Tunnel Re-opening (fall 2007)**

		Weekday Riders			Change since		1-Hr PM Peak Riders			Change since	
Ave	Dir	Spring 2005	Spring 2007	Fall 2007	Spring 2005	Spring 2007	Spring2005	Spring 2007	Fall 2007	Spring 2005	Spring 2007
1st	N	9,861	10,708	5,909	-40%	-45%	757	812	674	-11%	-17%
	S	6,002	5,892	4,291	-29%	-27%	469	691	406	-13%	-41%
2nd	S	14,794	15,859	9,460	-36%	-40%	2,465	1,999	1,767	-28%	-12%
3rd	N	17,849	29,273	28,276	+58%	-3%	1,478	2,824	2,500	+69%	-11%
	S	17,239	26,056	27,097	+57%	+4%	1,883	3,431	3,675	+95%	+7%
4th	N	10,375	16,894	9,257	-11%	-45%	825	950	637	-23%	-33%
5th	S	3,046	4,730	1,812	-41%	-62%	155	267	49	-68%	-82%
Tnl	N	12,991	N.A.	14,189	+9%	N.A.	1,188	N.A.	1,521	+28%	N.A.
	S	14,495	N.A.	14,793	+2%	N.A.	1,959	N.A.	2,147	+10%	N.A.
Total		106,651	109,411	115,084	+8%	+5%	11,179	10,974	13,376	+20%	+22%

Figure 11 compares fall 2007 data for standing loads on routes operated by King County Metro at University Street with standing loads before tunnel closure and before tunnel re-opening. The overall incidence of standing loads rose substantially after tunnel re-opening, particularly on First Avenue northbound, possibly indicating that these loads were due to fewer buses being available on First Avenue to serve the trips on First Avenue that are internal to the central business district.

In addition, standing loads in the tunnel southbound are at fairly high levels during the peak one hour. Since this analysis is based on preliminary fall data and a relatively small sample size, these figures may represent sampling error, as well as the fact that ridership is seasonally higher in the months of October and November than it is later in the fall signup.

**Figure 11. Loads over Seating Capacity at University Street, before and during Tunnel Closure and after Tunnel Re-opening**

Av	Dir	Average Loads Greater than Seat Capacity						Average Loads 20% over Seating Capacity					
		% of Weekday Trips			% of Peak 1-Hr Trips			% of Weekday Trips			% of Peak 1-Hr Trips		
		Sp05	Sp07	Fa07	Sp05	Sp07	Fa07	Sp05	Sp07	Fa07	Sp05	Sp07	Fa07
1 <sup>st</sup>	N	1.8%	1.5%	3.5%	7.5%	8.1%	15.3%	0.0%	0.4%	0.7%	0.0%	2.7%	7.7%
	S	1.3%	0.0%	1.4%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
2 <sup>nd</sup>	S	0.3%	0.5%	0.7%	0.0%	0.0%	0.0%	0.0%	0.0%	0.2%	0.0%	0.0%	0.0%
3 <sup>rd</sup>	N	1.2%	1.2%	3.8%	1.5%	0.0%	3.9%	0.2%	0.2%	1.0%	0.0%	0.0%	1.0%
	S	5.0%	1.6%	3.0%	4.7%	2.8%	5.0%	1.3%	0.1%	0.9%	1.6%	0.0%	0.8%
4 <sup>th</sup>	N	0.5%	0.1%	0.9%	0.0%	0.0%	0.0%	0.3%	0.0%	0.2%	0.0%	0.0%	0.0%
5 <sup>th</sup>	S	0.8%	0.0%	0.0%	0.0%	0.0%	0.0%	0.8%	0.0%	0.0%	0.0%	0.0%	0.0%
Tnl	N	0.4%	N.A.	1.1%	0.0%	N.A.	0.0%	0.0%	N.A.	0.0%	0.0%	N.A.	0.0%
	S	0.2%	N.A.	1.3%	0.0%	N.A.	5.5%	0.0%	N.A.	0.0%	0.0%	N.A.	0.0%
Total		1.3%	0.9%	2.3%	1.4%	1.4%	3.5%	0.3%	0.1%	0.5%	0.2%	0.2%	0.8%

Ridership crossing the University Street screenline in fall 2007 has risen well above levels seen before tunnel closure or during tunnel closure. Data from screenlines at the edges of the CBD indicate that loads leaving the CBD have also increased substantially since spring 2005, from 90,800 to over 110,000 riders each weekday, including loads on Community Transit and Pierce Transit-operated services. Similarly, loads entering the CBD increased from about 88,000 in spring 2005 to over 100,000 in fall 2007.

Standing loads on routes operated by King County Metro have also increased since spring 2007, although they are still a small fraction of outbound trips. Figure 12 compares the percent of trips with standing loads leaving downtown at various times of the day. The largest increase, not surprisingly, is in the PM peak, when 11.5 percent of trips leaving the Seattle CBD had standing loads, as compared to 3.4 percent of trips in spring 2005. This increase was spread across a number of routes, including ones not likely to be directly affected by tunnel closure or re-opening. This increase in overloads can probably be attributed to the general rise in ridership over the past three years.

**Figure 12. Percent of trips leaving CBD Averaging Standing Loads, before, during, and after Tunnel Closure and Re-opening.**

		AM Peak	Midday	PM Peak	Evening	Total
		6-9 AM	9AM-3 PM	3-7 PM	7-11 PM	
Standing Loads	Spring 2005	2.4%	2.7%	3.4%	0.3%	2.4%
	Spring 2007	3.3%	2.5%	5.3%	1.2%	3.6%
	Fall 2007	5.1%	6.4%	11.5%	1.7%	7.1%
Over 120% Load	Spring 2005	0.0%	0.7%	0.5%	0.0%	0.4%
	Spring 2007	0.6%	0.4%	1.2%	0.0%	0.7%
	Fall 2007	2.4%	2.4%	3.4%	0.0%	2.3%

## Measure 4: Pedestrian Activity at Bus Zones

### Monitoring Objectives

The purpose of monitoring pedestrian activity at bus zones was to quantitatively assess pedestrian congestion at critical bus stops within the Seattle downtown core. In particular, the study focused on the impacts that transit tunnel closure had on pedestrian congestion at or near bus stops on surface streets. This portion of the study aims to answer the following key questions:

- How crowded are bus stops after tunnel re-opening?
- Have the “hot-spots” that were identified in the pedestrian congestion study after tunnel closure been mitigated with the tunnel re-opening, or do problems remain?
- How does the amount of pedestrian congestion at key bus stops compare across baseline, tunnel closure, and tunnel re-opened conditions?

### Methodology

The studies for pedestrian activity at bus zones have focused on two elements of pedestrian congestion: pedestrian flow and pedestrian crowding.

Pedestrian flow is applicable to the movement through the bus zone and is based on the number of pedestrians passing per minute passing through a walkway of limited width. The *2000 Highway Capacity Manual* specifies criteria for LOS designations of A through F for walkways. In addition to these criteria, pedestrian level of service was further evaluated using procedures outlined in *Urban Spaces for Pedestrians* by Pushkarev and Zupan (1975).

Pedestrian crowding is applicable to waiting and queuing areas, and is based on the average space available per person. The Transit Cooperative Research Program (TCRP) Transit Capacity and Quality of Service Manual specify criteria for Level of Service (LOS) designations ranging from A to F for queuing and waiting areas (Part 7, Chapter 3). In addition to these national guidelines, Metro applied its own criteria to the amount of space available per person in bus stop waiting areas.

Volume 1 of the *Performance Report on Surface Streets in the Seattle Central Business District* includes a more detailed description of the pedestrian survey methodology and criteria used for pedestrian level of service assessment. To measure the pre-tunnel closure conditions, an initial pedestrian congestion study was conducted at 19 selected bus zones in spring 2005<sup>1</sup>. These results were reported in Volume 1. In the first post-tunnel closure study, conducted in fall 2005, 25 bus zones were studied, including newly installed bus stops<sup>2</sup>. These results were reported in Volume 2. Based on these results, five “hot spot” locations were selected for further study<sup>3</sup>, and the results were reported in Volume 3. For this seventh and final volume, the “hot spot” locations were revisited to see if tunnel re-opening had changed the pedestrian condition. In addition to the hot spot locations, three additional bus zones on Third Avenue were selected for analysis. The data for these eight zones constituted the tunnel-re-opening pedestrian study. The results from this study are compared with applicable data from the three other pedestrian congestion studies that were previously conducted at these sites. Figure 13 shows the 25 bus stops that were surveyed during one or more of the studies. All of the data collection for the tunnel re-opening study was conducted between October 30, 2007 and November 15, 2005, on Tuesdays, Wednesdays, and Thursdays only.

---

<sup>1</sup> Pedestrian Congestion Study, Existing Conditions Analysis, 7-18-2005

<sup>2</sup> Pedestrian Congestion Study, Fall 2005 Conditions Report, 11-23-2005

<sup>3</sup> Pedestrian Congestion Study Addendum, Spring 2006 “Hot Spot” Analysis, 3-8-2006

Figure 13. Bus Stops Surveyed for Pedestrian Congestion Counts



Figure 14A summarizes the cumulative results of the pedestrian congestion studies at the eight zones selected for monitoring after tunnel re-opening, as they relate to pedestrians walking through the bus zones. Figure 14B summarizes the cumulative results of these same bus zones as they relate to pedestrians waiting at the bus stops.

**Figure 14A. Walking Pedestrian Rank and Level of Service by Bus Stop.**

Bus Stop Location		Tunnel OPEN		Tunnel CLOSED				Tunnel OPEN	
		Spring 2005		Fall 2005		Spring 2006		Fall 2007	
Zone #	On-street/Cross Street	HCM LOS	Pushkarev & Zupan Rank	HCM LOS	Pushkarev & Zupan Rank	HCM LOS	Pushkarev & Zupan Rank	HCM LOS	Pushkarev & Zupan Rank
300	SB 2 <sup>nd</sup> Ave./Pike St.	A	Impeded	A	Impeded	A	Unimpeded	B	Impeded
315	SB 2 <sup>nd</sup> Ave./University St.	A	Impeded	A	Impeded	A	Impeded	A	Impeded
430	SB 3 <sup>rd</sup> Ave./Pine St.	A	Impeded	A	Impeded			A	Impeded
431	SB 3 <sup>rd</sup> Ave./Pike St.			A	Impeded			B	Impeded
578	NB 3 <sup>rd</sup> Ave./Pike St.	A	Impeded	A	Impeded			A	Impeded
590	NB 3 <sup>rd</sup> Ave./Pine St.	A	Unimpeded	A	Impeded	A	Impeded	A	Impeded
690	NB 4 <sup>th</sup> Ave./Union St.	A	Impeded	C	Constrained	A	Impeded	A	Impeded
860	NB 5 <sup>th</sup> Ave./James St.	A	Impeded	A	Impeded	A	Impeded	A	Impeded

(Shaded cells indicate that the bus stop was not counted during that particular study)

All of the selected bus stops are at acceptable levels of service during the evening peak 15-minutes. Two of the locations have shown some degradation in pedestrian walking level of service since the initial tunnel closure study.

**Figure 14B. Standing Pedestrian Level of Service for Full Bus Stop Area and Critical Loading Zone**

Bus Stop Location		Tunnel OPEN		Tunnel CLOSED				Tunnel OPEN	
		Spring 2005		Fall 2005		Spring 2006		Fall 2007	
Zone #	On-street/Cross Street	HCM LOS	King County Rank	HCM LOS	King County Rank	HCM LOS	King County Rank	HCM LOS	King County Rank
300	SB 2 <sup>nd</sup> Ave./Pike St.	A	Desirable	A	Desirable	A	Desirable	A	Desirable
	Critical Zone	A	Constrained	B	Constrained	A	Constrained	A	Constrained
315	SB 2 <sup>nd</sup> Ave./University St.	A	Desirable	A	Desirable	A	Desirable	A	Desirable
	Critical Zone	A	Constrained	B	Constrained	A	Desirable	B	Constrained
430	SB 3 <sup>rd</sup> Ave./Pine St.	A	Desirable	A	Desirable			A	Desirable
	Critical Zone	A	Desirable	A	Desirable			A	Constrained
431	SB 3 <sup>rd</sup> Ave./Pike St.			A	Desirable			A	Constrained
	Critical Zone			A	Desirable			B	Constrained
578	NB 3 <sup>rd</sup> Ave./Pike St.	A	Desirable	A	Desirable			A	Constrained
	Critical Zone	A	Desirable	A	Constrained			B	Constrained
590	NB 3 <sup>rd</sup> Ave./Pine St.	A	Desirable	A	Constrained	A	Desirable	A	Desirable
	Critical Zone	A	Desirable	A	Constrained	A	Constrained	A	Constrained
690	NB 4 <sup>th</sup> Ave./Union St.	A	Desirable	A	Desirable	A	Desirable	A	Desirable
	Critical Zone	A	Desirable	A	Desirable	A	Desirable	A	Desirable
860	NB 5 <sup>th</sup> Ave./James St.	A	Desirable	B	Constrained	A	Desirable	A	Desirable
	Critical Zone	B	Constrained	C	Uncomfortable	A	Constrained	C	Constrained

During the PM peak period, all of the bus zones included in this study still operate at a high level of service, LOS A, as defined by the nationally accepted guidelines in the Highway Capacity Manual, and considering the entire bus zone waiting area. Using a more stringent methodology developed by King

County, the critical loading areas for seven of the eight study bus zones experience constrained conditions.

### **Summary Observations**

Conditions for walking pedestrians have remained relatively consistent across all survey periods for the eight bus zones included in the fall 2007 survey. Overall, the level of service for walking pedestrians appears to be relatively unaffected by either the closure or the re-opening of the Third Avenue transit tunnel. Level of service is more affected by localized changes related to the available sidewalk space.

For waiting pedestrians, most of the eight bus zones included in the fall 2007 survey are operating under “Desirable” conditions at LOS A. However, three of the locations have degraded somewhat over conditions that were observed before and during tunnel closure, as described below:

- Zone 860 (NB 5th Ave & James St): This bus zone continues to be the most crowded of the study locations during the PM peak. The number standing pedestrians in the critical loading zone has increased over the previous study; however, the number is not as high as conditions just after tunnel closure (Fall 2005). This zone also has the narrowest sidewalk of all of the study zones, which contributes to its high level of crowding.
- Zones 431 and 578 (NB and SB 3rd Ave & Pike St): These bus zones operated at LOS A and “Constrained” conditions during the fall 2007 study, which is somewhat degraded from the conditions during tunnel closure. This is likely due to the addition of several high-ridership routes to Third Avenue during the tunnel re-opening. In addition, the overall increases in Metro ridership between 2005 and 2007 have likely increased the usage of these bus stops.

Even with the bus zones operating at a lower level of service or rank than previous surveys, all of the bus zones operated at or above LOS C and at or above “Constrained” conditions in the fall 2007 survey, which are acceptable levels of service for waiting pedestrians.

## **Measure 5: Seattle Central Business District Customer Surveys**

### **Background**

The downtown Seattle transit tunnel, a thoroughfare for specific bus routes traveling through downtown Seattle, closed in September 2005 to allow for construction of a light rail line. The tunnel re-opened to bus traffic in September 2007. Light rail operation is expected to begin in 2009. During the construction period, buses that formerly used the tunnel were re-routed onto surface streets in downtown Seattle.

King County Department of Transportation, Metro Division, acting on behalf of a multi-agency team, contracted with the Gilmore Research Group to evaluate the behavior of bus riders and auto drivers before and during the tunnel closure and after the tunnel reopened. The purpose of the research was to understand:

- Changes in use of the downtown Seattle area
- The perceived impact of re-routed buses on travel time to and within downtown Seattle
- Satisfaction with various elements of travel within downtown Seattle such as travel time, parking availability, and on-time performance at downtown bus stops
- Overall satisfaction with the downtown Seattle experience

A baseline study of downtown Seattle users was conducted in August 2005, approximately one month before the tunnel closed. A formal feedback survey was conducted in the summer of 2006. The 2007 survey is the first formal survey conducted after the tunnel opened again.

### **Methodology**

Three distinct groups of downtown Seattle users were targeted for this study:

- Bus riders
- Auto travelers to downtown who park in surface lots or parking garages
- Auto travelers to downtown who park on the street in downtown Seattle

### **Questionnaire Development**

Gilmore Research worked with KC Metro staff to develop a questionnaire suitable for all three respondent groups. Topics explored in the study include:

- Reasons for coming to downtown Seattle
- Travel mode to downtown
- Travel time to downtown destinations
- Personal comfort and satisfaction with various elements of the downtown experience
- Information sources about the tunnel reopening

The survey was designed so it could be completed over the phone or online.

## Cluster Selection

The sampling frame consisted of a complete listing of the bus stops, garage/lots and metered parking blocks in downtown Seattle. Clusters of 35 bus stops, 25 garages/lots and 20 parking meter blocks were randomly selected from this list for data collection purposes.

Several of the Garage/Lot Cluster locations used in 2006 were closed or refused access to Gilmore interviewers and had to be replaced. Replacement garage/lot locations were chosen using the same process described above. Each parking garage/lot was given one chance for random selection for each slot available for parking (i.e., 14 spots = 14 chances, 150 spots = 150 chances). Thus, larger venues had a greater chance to be selected over smaller ones. Each parking lot was only selected once.

## Recruitment

Gilmore Research staff wearing Metro aprons traveled to select downtown locations to recruit survey respondents. All recruiting occurred on weekdays between 2 and 6 PM. Respondents were recruited from October 16 to November 15, 2007.

Gilmore staff collected names and telephone numbers of individuals willing to participate in a telephone survey at bus, garage/lot and parking meter locations. Those who did not want to participate in the phone survey were given a postcard with a website address so they could do the survey online. The postcards explained the purpose of the survey, provided the website address and a unique PIN number that would allow respondents to complete the survey online. See Figure 15 to view sample disposition.

**Figure 15. Telephone Survey Sample Disposition**

	2007 Bus Cluster Sample	2007 Percent of Bus Sample	2007 Garage/ Lot Cluster Sample	2007 Percent of Garage/ Lot Sample	2007 On-Street Parking Cluster Sample	2007 On-Street Parking Cluster Percent
<b>Total Sample Attempted</b>	<b>1,255</b>	<b>100%</b>	<b>647</b>	<b>100%</b>	<b>357</b>	<b>100%</b>
Disconnected	61	5	21	3	14	4
Business/FAX	1	<1	3	<1	1	<1
Wrong Number	35	3	10	2	6	2
<b>Subtotal Non-working</b>	<b>97</b>	<b>8%</b>	<b>34</b>	<b>5%</b>	<b>21</b>	<b>6%</b>
<b>Usable Sample</b>	<b>1,158</b>	<b>92%</b>	<b>613</b>	<b>95%</b>	<b>336</b>	<b>94%</b>
No answer	49	4	16	2	7	2
Answering machine	509	41	235	36	102	29
Respondent not available	112	9	88	14	16	4
Busy signal	30	2	14	2	4	1
Blocked number	5	<1	1	<1	---	---
<b>Subtotal No Contact</b>	<b>705</b>	<b>56%</b>	<b>354</b>	<b>55%</b>	<b>129</b>	<b>36%</b>
<b>Total Sample Contacted</b>	<b>453</b>	<b>36%</b>	<b>259</b>	<b>40%</b>	<b>207</b>	<b>58%</b>
Refusals	14	1	18	2	4	1
Terminate/Incomplete	9	1	2	<1	3	1
<b>Subtotal Refusals/Incomplete</b>	<b>23</b>	<b>2%</b>	<b>20</b>	<b>3%</b>	<b>7</b>	<b>2%</b>
Not qualified (misc.)	10	1	6	1	2	1
Language barrier/ hearing problem	24	2	5	1	11	3
<b>Subtotal Not Qualified</b>	<b>34</b>	<b>3%</b>	<b>11</b>	<b>2</b>	<b>13</b>	<b>4%</b>
<b>Completed Telephone Interviews</b>	<b>396</b>	<b>32%</b>	<b>228</b>	<b>35%</b>	<b>187</b>	<b>52%</b>
<b>Complete Online/Web Interviews</b>	<b>8</b>	<b>---</b>	<b>3</b>	<b>---</b>	<b>5</b>	<b>---</b>
<b>Total Completed Interviews</b>	<b>404</b>		<b>231</b>		<b>192</b>	
May not sum to 100% due to rounding.						



## **Data Collection**

Between October 18 and November 20, 2007, Gilmore Research completed 827 telephone interviews with respondents recruited from the bus (404), garage/lot (231) and on-street parking locations (192). The telephone survey took 11 minutes to complete on average.

Sixteen individuals completed the survey online including 8 from bus stop locations, 3 from garage/parking lot locations and 5 from the on-street parking spaces.

## **Analysis and Reporting**

As noted above, data were collected from three discrete populations who use the downtown area. Since the population of downtown users in each of these groups is unknown, it is not possible to combine the data into a proportionately representative “snapshot” of all downtown users. For this reason, even though respondents from the Bus Clusters may also travel to downtown by automobile and vice versa, the groups are analyzed separately in the report that follows.

Comparisons are made between survey findings from data collected in 2005 (prior to the tunnel closure), 2006 (during tunnel closure) and 2007 (after tunnel reopened) across all three respondent groups as appropriate. In 2005, the number of respondents surveyed from the parking meter clusters was too small for statistically reliable comparisons to be made. Thus, comparisons are made between 2006 and 2007 data only for this group. Unless otherwise indicated, all statistically significant differences are reported at the 95% confidence level. “Don’t know” and “refused” responses are included in the base though they may not be shown in the tables and figures.

### Respondent Profile

Characteristics of respondents to the 2007 survey from the Bus and Garage/Lot Clusters were very similar to those of the 2006 survey respondents, as shown in Figure 16. Statistically significant differences between sample clusters noted in 2007 include:

- 2007 respondents from the Bus Clusters were more likely than those in 2006 to report making 1 to 5 trips a month to downtown Seattle (16% and 9% respectively).
- Fewer Bus Cluster respondents in 2007 were ages 16 to 24 (4% v. 14% in 2006).
- Fewer respondents in the Garage/Lot Clusters were ages 25 to 44 than recorded in 2006 (22% and 30% respectively).
- Respondents in the On-Street Parking sample were more likely than those from the Bus Cluster sample to be male (56% and 47% respectively).

The majority of respondents in all cluster groups live in North King County. Respondents from the Garage/Lot Clusters were more than twice as likely as those in the Bus or On-Street Parking Clusters to live in East King County.

As expected with the high proportion of commuters, the majority of respondents from all Cluster groups reported making 20 or more trips to downtown Seattle per month (72% Bus, 63% Garage/Lot, and 54% On-Street Parking). The percentage difference between On-Street Parking respondents and Bus Cluster respondents who go downtown 20 or more times per month is statistically significant.

**Figure 16. Respondent Characteristics by Cluster Type**  
*All 2006 survey respondents*

<b>(Base)</b>	<b>Bus Clusters (n=404)</b>	<b>Garage/Lot Users (n=231)</b>	<b>On-Street Parking Clusters (n=192)</b>
<b>*Commuter Status</b>			
Commuter	80%	79%	70%
Non-commuter	20	21	30
<b>Area</b>			
North King County	57%	42%	59%
South King County	17	16	16
East King County	7	22	10
Other	19	20	15
<b>Trips to Downtown Seattle</b>			
Live in downtown Seattle	4%	1%	3%
Less than once a month	2	2	3
1 to 5 trips/month	9	16	18
6 to 9 trips/month	4	5	7
10 to 19 trips/month	10	12	16
20 or more trips/month	72	63	54
Don't know	---	<1	---
<i>Average trips per month</i>	<i>20</i>	<i>17</i>	<i>17</i>
<b>**Regular Downtown Seattle Users</b>			
Yes	95%	89%	91%
No	5	11	9
<b>Age Groups</b>			
16 to 19	1%	0%	0%
20 to 24	3	<1	1
25 to 34	10	7	7
35 to 44	24	22	22
45 to 54	21	26	28
55 to 64	22	24	24
65 or Older	16	16	16
Refused	5	6	3
<i>Average age</i>	<i>42 years</i>	<i>43 years</i>	<i>43 years</i>
<b>Gender</b>			
Male	47%	49%	56%
Female	53	51	44
* A <b>Commuter</b> is someone who makes 3 or more work/school trips per week.			
** A <b>Regular User</b> lives in downtown Seattle or makes 3+ trips downtown per month.			
<b>May not sum to 100% due to rounding.</b>			

## **Key Findings**

At least three-quarters of respondents from the Bus (80%) and Garage/Lot Clusters (79%) are commuters to downtown Seattle for work or school as are 70% of those from the On-Street Parking Clusters. The majority of respondents in the Bus (57%) and On-Street Parking Clusters (59%) live in North King County as does a plurality of Garage/Lot Cluster respondents (42%). Respondents from the On-Street Parking sample were significantly more likely to be male than those in the Bus Cluster group.

### Travel to Downtown Seattle

More than six in ten respondents in both the Bus Cluster sample and the Garage/Lot sample reported traveling to downtown Seattle 20 or more times per month (72% Bus, 63% Garage/Lot), significantly more than respondents from the Parking Meter sample (54%).

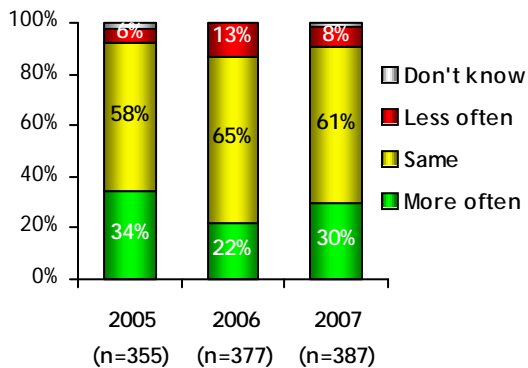
81% of respondents from the Bus Cluster sample and 84% from the Garage/Lot sample work or attend school in downtown Seattle, slightly, but not significantly more than those from the On-Street Cluster sample (75%). The majority of these respondents make at least 20 trips downtown for work or school each month (86% from Bus Cluster sample, 72% from Garage/Lot sample and 69% from Parking Meter sample).

More than half of the respondents in all three sample groups travel downtown for shopping, medical appointments or to run errands (57% Bus, 53% Garage/Lot and 62% On-Street Parking). Garage/Lot Cluster respondents reported significantly fewer of these types of trips on average in 2007 than in 2006 (3.6 and 5.3 trips per month respectively) while those in the Bus Cluster and On-Street Parking Cluster samples did not change significantly.

Nearly six in ten Bus Cluster respondents reported coming downtown for entertainment purposes (59%) as did 72% of those in the Garage/Lot and On-Street Parking sample groups. Respondents from each sample group reported an average of 2 to 4 trips downtown for entertainment purposes (3.0 Bus Clusters, 2.4 Garage/Lot Clusters, and 3.8 On-Street Parking Cluster). The average number of entertainment trips for respondents in these sample groups has not changed significantly since 2006.

More than six in ten respondents from each of the three sample groups reported that they come to downtown Seattle as often now as they did a year ago (61% Bus Cluster, 62% for Garage/Lot Cluster, 67% for On-Street Parking Cluster respondents). When compared with findings from 2006, responses from the Bus Cluster sample showed a significant increase in the percentage who said they come to downtown Seattle more often than they did a year ago (22% in 2006 and 30% in 2007). None of the respondents said the reason they come downtown less often was related to the tunnel re-opening (see Figures 17A, 17B and 17C below).

**Figure 17A. Travel to Downtown Seattle Compared to Last Year**  
*Bus cluster respondents not living in downtown Seattle*



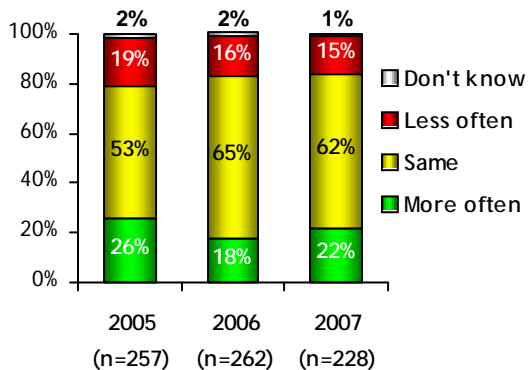
**Question 11:**

Would you say you are going to downtown Seattle less often than last year, more often than last year, or about the same as last year?

*"Don't know" was 1% or less*

**May not sum to 100% due to rounding.**

**Figure 17B Travel to Downtown Seattle Compared to Last Year**  
*Garage/Lot respondents not living in downtown Seattle*

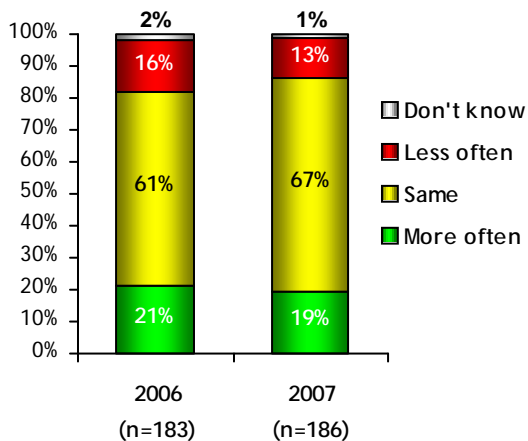


**Question 11:**

Would you say you are going to downtown Seattle less often than last year, more often than last year, or about the same as last year?

**May not sum to 100% due to rounding.**

**Figure 17C Travel to Downtown Seattle Compared to Last Year**  
*On-street cluster respondents not living in downtown Seattle*



**Question 11:**

Would you say you are going to downtown Seattle less often than last year, more often than last year, or about the same as last year?

**May not sum to 100% due to rounding**

Reported use of a car to travel to and around downtown Seattle did not change significantly since 2006 for respondents in any of the three sample groups.

Half (50%) of the bus riders in the Bus Cluster sample, 44% of those in the Garage/Lot sample and 40% of those in the On-Street Parking sample were satisfied with how the tunnel re-opening has affected bus travel downtown. Very few respondents were dissatisfied (11% Bus Cluster, 8% Garage/Lot Cluster, 3% On-Street Parking Cluster) with the remainder saying they were neither satisfied nor dissatisfied.

For both Bus and Garage/Lot respondents, travel is most common during the morning commute hours from 6 to 9 AM on weekdays. Respondents from the On-Street Cluster were equally likely to travel during all time periods queried in the survey. Respondents coming downtown for work or school are especially likely to travel during weekday morning commute hours. Those coming downtown to shop or run errands were most likely to travel on weekends during the day while those coming downtown for entertainment traveled more often on weekend evenings.

Thirty percent of respondents in the Bus Cluster sample reported traveling to downtown Seattle between 3 and 6 PM weekdays and 38% percent reported traveling on weekend evenings (38%); which is significantly less than in either 2005 or 2006. Significantly fewer (67%) Garage/Lot respondents in 2007 reported traveling to downtown Seattle on weekdays during morning and evening commute hours than in 2006. In 2007, significantly fewer (43%) On-Street Parking respondents reported traveling downtown on weekdays between 3 and 6 PM (see Figures 18A, 178B and 18C below).

**Figure 18A Time of Day Travel to Downtown Seattle by Purpose**

*All bus cluster respondents*

	2005 All Purposes (n=367)	2006 All Purposes (n=387)	--2007--			
			All Purposes (n=404)	Work/ School (n=327)	Shopping/ Medical/ Errands (n=230)	Dining/ Sports/ Entertainment (n=238)
<b>(Base)</b>						
Weekdays 6 to 9 AM	72%	77%	73%	87%	9%	2%
Weekdays 9 AM to 3 PM	41	36	32	11	42	9
Weekdays 3 to 6 PM	42	41	30	14	25	20
Weekdays after 6 PM	41	33	35	13	11	41
Weekends during the day	53	52	51	17	60	39
Weekends during the evening	48	47	38	6	14	55
Was already downtown	---	---	6	---	8	4
<b>Question 3A:</b> Which of the following times of day do you usually travel to downtown for work or school? <b>Question 6A:</b> Which of the following times of day do you usually travel to downtown for shopping, appointments and other errands? <b>Question 9A:</b> Which of the following times of day do you usually travel to downtown for dining, sports, or other entertainment? <b>Multiple responses allowed. "Don't know" responses not shown.</b>						

**Figure 18B. Time of Day Travel to Downtown Seattle by Purpose**

*All garage/lot respondents*

	2005 All Purposes (n=265)	2006 All Purposes (n=263)	--2007--			
			All Purposes (n=231)	Work/ School (n=195)	Shopping/ Medical/ Errands (n=123)	Dining/ Sports/ Entertainment (n=166)
<b>(Base)</b>						
Weekdays 6 to 9 AM	71%	75%	67%	78%	4%	2%
Weekdays 9 AM to 3 PM	45	33	35	22	30	11
Weekdays 3 to 6 PM	37	37	26	9	18	19
Weekdays after 6 PM	51	41	38	9	13	43
Weekends during the day	68	49	43	10	54	33
Weekends during the evening	62	51	49	5	18	65
Was already downtown	---	---	9	---	15	5
<b>Question 3A:</b> Which of the following times of day do you usually travel to downtown for work or school? <b>Question 6A:</b> Which of the following times of day do you usually travel to downtown for shopping, appointments and other errands? <b>Question 9A:</b> Which of the following times of day do you usually travel to downtown for dining, sports, or other entertainment? <b>Multiple responses allowed. "Don't know" responses not shown.</b>						

**Figure 18C. Time of Day Travel to Downtown Seattle by Trip Purpose**

*All on-street cluster respondents*

	2006 All Purposes (n=192)	--2007--			
		2007 All Purposes (n=192)	Work School (n=143)	Shopping Medical Errands (n=118)	Dining Sports Entertainment (n=138)
<b>(Base)</b>					
Weekdays 6 to 9 AM	49%	47%	59%	6%	1%
Weekdays 9 AM to 3 PM	54	49	42	43	7
Weekdays 3 to 6 PM	56	43	31	31	15
Weekdays after 6 PM	53	46	12	22	53
Weekends during the day	53	51	24	55	24
Weekends during the evening	52	53	14	20	67
Already downtown	---	5	---	4	4
<b>Question 3A:</b> Which of the following times of day do you usually travel to downtown for work or school? <b>Question 6A:</b> Which of the following times of day do you usually travel to downtown for shopping, appointments and other errands? <b>Question 9A:</b> Which of the following times of day do you usually travel to downtown for dining, sports, or other entertainment? <b>Multiple responses allowed. "Don't know" responses not shown.</b>					

Mode choice to downtown was highly correlated with sample type. Riding the bus was the dominant mode choice among respondents from the Bus sample for non-discretionary purposes (93% work/school, 65% shopping/medical/errands). Bus Cluster respondents were as likely to say they usually travel by car (46%) as they were by bus (47%) when coming downtown for entertainment. Among Garage/Lot

respondents, car was the most common mode choice for all trip types (84% work/school, 90% shopping/medical/errands, and 93% entertainment). On-Street Parking Cluster respondents were also most likely to travel by car for all trip types (77% work/school, 81% shopping/medical/errands, and 88% entertainment).

The percentage of Garage/Lot Cluster respondents who usually commute to work or school by car/carpool has increased significantly in each of the last two years from 61% in 2005 to 75% in 2006 to 84% in 2007). Garage/Lot Cluster respondents who use a car for shopping trips also increased significantly from 79% in 2006 to 90% in 2007. On-Street Parking Cluster respondents were significantly more likely to report usually traveling by car for shopping trips (69% in 2006, 81% in 2007) and entertainment trips (77% in 2006 and 88% in 2007).

Overall travel time from the beginning of a trip to the final destination in downtown Seattle regardless of trip purpose averaged 37.0 minutes for Bus Cluster respondents, 33.8 minutes for Garage/Lot Cluster respondents and 28.1 minutes for On-Street Parking Cluster respondents. While average travel times for all three groups have increased since 2005, the only statistically significant increase was for Bus Cluster respondents whose average travel time was 32.7 minutes in 2005 (see Figures 18A and 18B below).

Figures 19A - C below show that bus travelers had significantly longer travel times to work (41 minutes) than those from the Garage/Lot (35 minutes) and Parking Meter Clusters (30 minutes). Bus Cluster respondents had slightly longer travel times than Garage/Lot customers for shopping/medical/errands (31 and 28 minutes respectively) and significantly longer travel times than On-Street Parking Cluster respondents (23 minutes). Garage/Lot Cluster respondents reported the longest average travel time for entertainment trips (32 minutes, compared to 30 minutes for Bus Cluster respondents and 27 minutes for On-Street Parking Cluster respondents).

**Figure 19A Total Travel Time to Work/School**

*Bus cluster respondents who travel downtown by bus or car/carpool*

	2005	2006	2007
<b>(Base)</b>			
<b>Work/School</b>	<b>(n=275)</b>	<b>(n=306)</b>	<b>(n=312)</b>
0 to 10 Minutes	2%	3%	4%
11 to 15 Minutes	9	12	6
16 to 30 Minutes	48	38	39
31 to 60 Minutes	34	38	42
Over 60 Minutes	7	8	10
<i>Average</i>	<i>34.9 Min.</i>	<i>36.9 Min.</i>	<i>40.7Min.</i>
<b>Shop/Medical/Errands</b>	<b>(n=210)</b>	<b>(n=203)</b>	<b>(n=190)</b>
0 to 10 Minutes	12%	16%	10%
11 to 15 Minutes	15	14	17
16 to 30 Minutes	44	41	40
31 to 60 Minutes	23	22	25
Over 60 Minutes	5	6	5
<i>Average</i>	<i>30.2 Min.</i>	<i>30.4 Min.</i>	<i>31.1 Min.</i>
<b>Dining/Sports/Entertainment</b>	<b>(n=231)</b>	<b>(n=218)</b>	<b>(n=213)</b>
0 to 10 Minutes	11%	8%	9%
11 to 15 Minutes	17	20	18
16 to 30 Minutes	43	42	38
31 to 60 Minutes	25	24	28
Over 60 Minutes	3	5	3
<i>Average</i>	<i>28.6 Min.</i>	<i>31.3 Min.</i>	<i>29.8 Min.</i>
<b>Average Across All Purposes</b>	<b>32.7 Min.</b>	<b>34.9 Min.</b>	<b>37.0 Min.</b>
<b>Questions 4B, 7B, 10B:</b> How long does it take you to travel from the beginning of your trip to (trip purpose) downtown by (travel mode)?			
<b>May not sum to 100% due to rounding.</b>			

**Figure 19B. Total Travel Time to Work/School***Garage/lot respondents who travel downtown by bus or car/carpool*

	2005	2006	2007
<b>(Base)</b>			
<b>Work/ School</b>	<b>(n=204)</b>	<b>(n=210)</b>	<b>(n=184)</b>
0 to 10 Minutes	9%	9%	9%
11 to 15 Minutes	14	15	14
16 to 30 Minutes	38	42	38
31 to 60 Minutes	33	26	31
Over 60 Minutes	6	7	9
<i>Average</i>	<i>32.5 Min.</i>	<i>31.1Min.</i>	<i>35.0 Min.</i>
<b>Shop/ Medical/ Errands</b>	<b>(n=161)</b>	<b>(n=125)</b>	<b>(n=100)</b>
0 to 10 Minutes	19%	20%	20%
11 to 15 Minutes	16	26	14
16 to 30 Minutes	45	38	37
31 to 60 Minutes	16	10	26
Over 60 Minutes	3	5	3
<i>Average</i>	<i>25.4 Min.</i>	<i>24.1Min.</i>	<i>28.2 Min.</i>
<b>Dining/ Sports/ Entertainment</b>	<b>(n=196)</b>	<b>(n=175)</b>	<b>(n=151)</b>
0 to 10 Minutes	12%	10%	12%
11 to 15 Minutes	13	21	18
16 to 30 Minutes	47	42	36
31 to 60 Minutes	23	19	29
Over 60 Minutes	5	8	5
<i>Average</i>	<i>29.9 Min.</i>	<i>30.4 Min.</i>	<i>32.3 Min.</i>
<b>Average Across All Purposes</b>	<b>30.0 Min.</b>	<b>30.2 Min.</b>	<b>33.8 Min.</b>
<b>Questions 4B, 7B, 10B:</b> How long does it take you to travel from the beginning of your trip to (trip purpose) downtown by (travel mode)? <b>May not sum to 100% due to rounding.</b>			

**Figure 19C. Total Travel Time to Work/School***On-street parking respondents who travel downtown by bus or car/carpool*

	2006	2007
<b>(Base)</b>		
<b>Work/ School</b>	<b>(n=122)</b>	<b>(n=134)</b>
0 to 10 Minutes	15 %	15%
11 to 15 Minutes	25	9
16 to 30 Minutes	28	40
31 to 60 Minutes	28	26
Over 60 Minutes	4	5
<i>Average</i>	<i>27.9 Min.</i>	<i>29.7 Min</i>
<b>Shop/ Medical/ Errands</b>	<b>(n=85)</b>	<b>(n=99)</b>
0 to 10 Minutes	18 %	14
11 to 15 Minutes	26	29
16 to 30 Minutes	35	38
31 to 60 Minutes	18	13
Over 60 Minutes	2	2
<i>Average</i>	<i>25.7 Min.</i>	<i>22.7 Min.</i>
<b>Dining/ Sports/ Entertainment</b>	<b>(n=116)</b>	<b>(n=124)</b>
0 to 10 Minutes	17 %	15
11 to 15 Minutes	23	24
16 to 30 Minutes	37	35
31 to 60 Minutes	19	21
Over 60 Minutes	3	5
<i>Average</i>	<i>26.2 Min.</i>	<i>26.9 Min.</i>
<b>Average Across All Purposes</b>	<b>27.7 Min.</b>	<b>28.1 Min.</b>
<b>Questions 4B, 7B, 10B:</b> How long does it take you to travel from the beginning of your trip to (trip purpose) downtown by (travel mode)? <b>May not sum to 100% due to rounding.</b>		

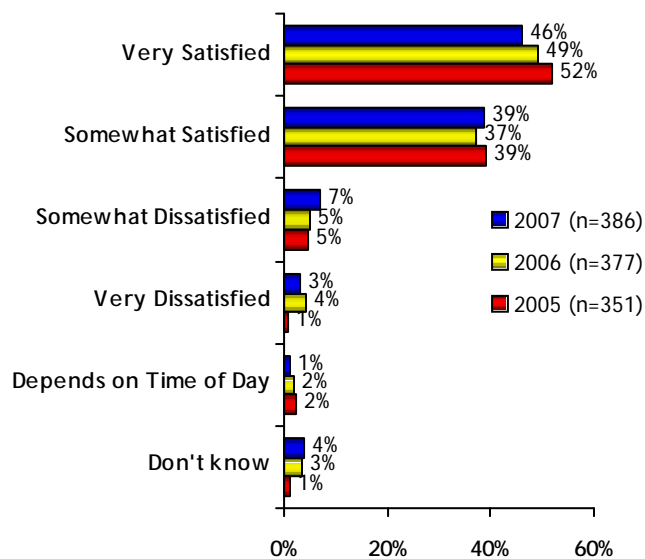


## Personal Comfort in Downtown Seattle

A substantial majority of respondents from all sample groups (85% Bus, 85% Garage/Lot and 85% On-Street Parking) said they are satisfied with their ability to walk around downtown Seattle without feeling crowded. Both the Bus and Garage/Lot groups were less satisfied with downtown crowding than in 2005 and 2006—especially for Garage/Lot respondents where the percentage who said they were “very satisfied” dropped significantly from 51% in 2006 to 46% in 2007. Responses from the On-Street Parking group showed a similar pattern (51% “very satisfied in 2006 to 41% in 2007), but the difference was not statistically significant (See Figures 20A, 20B and 20C below).

**Figure 20A. Satisfaction with Ability to Walk Around Without Feeling Crowded**

*Bus cluster respondents who travel downtown by bus, car or carpool*



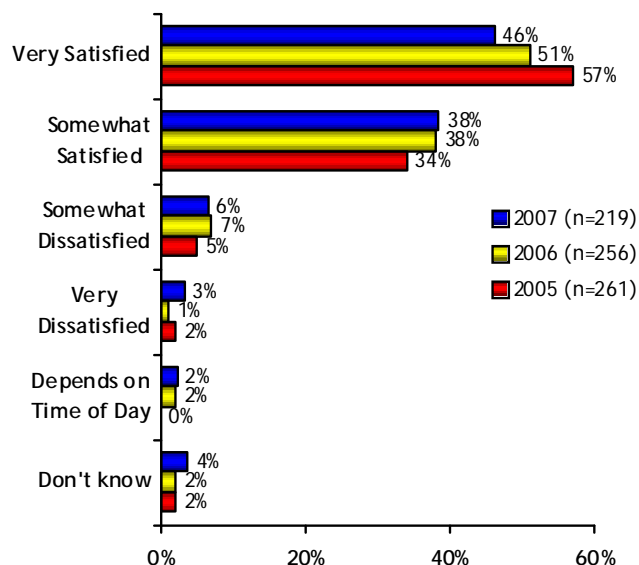
### Questions 18 and 30:

Are you satisfied/dissatisfied with being able to walk around downtown without feeling crowded?

May not sum to 100% due to rounding.

**Figure 20B. Satisfaction with Ability to Walk Around Without Feeling Crowded**

*Garage/Lot Cluster respondents who travel downtown by bus, car or carpool*

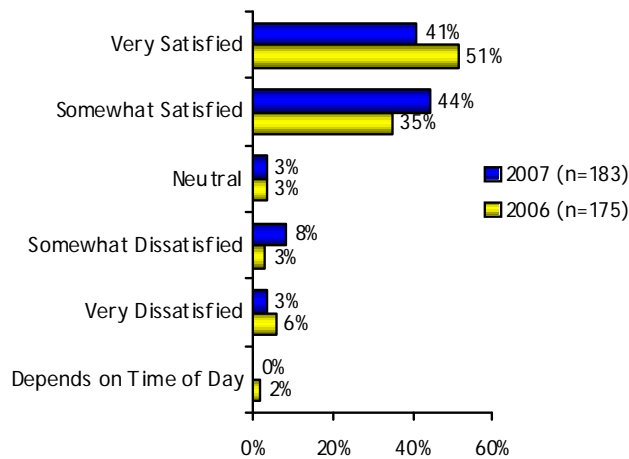


### Questions 18 and 30:

Are you satisfied/dissatisfied with being able to walk around downtown without feeling crowded?

May not sum to 100% due to rounding

**Figure 20C. Satisfaction with Ability to Walk Around Without Feeling Crowded**  
*On-Street Parking Cluster respondents who travel downtown by bus, car or carpool*



**Questions 18 and 30:**

Are you satisfied/dissatisfied with being able to walk around downtown without feeling crowded?

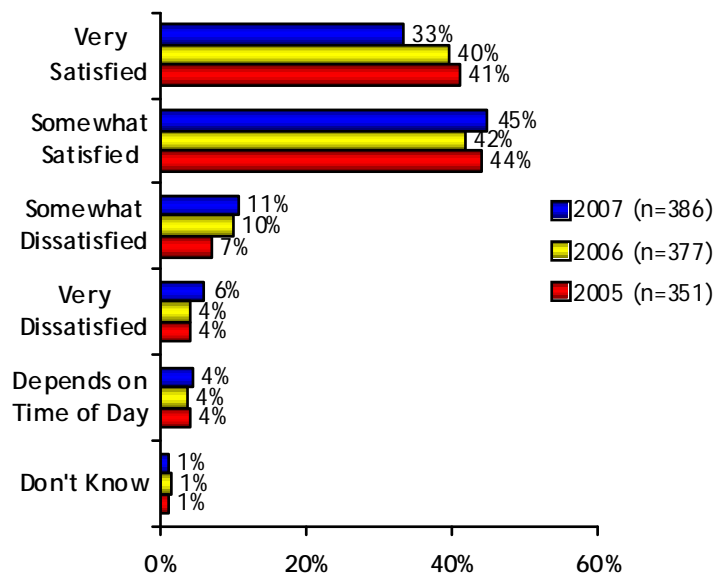
**May not sum to 100% due to rounding.**

Figures 21A, 21B and 21C below show that more than three-quarters of respondents from all sample groups (78% Bus, 74% Garage/Lot and 81% Parking Meter) said they are satisfied with their personal security and safety when in downtown Seattle. Significantly fewer respondents in all three sample groups indicated they were “very satisfied” with their personal safety compared to the percentages recorded in 2006:

- Bus Clusters – 40% in 2006 to 33% in 2007
- Garage/Lot Clusters – 43% in 2006 to 29% in 2007
- On-Street Parking Clusters – 46% in 2006 to 32% in 2007

**Figure 21A. Satisfaction with Personal Security and Safety**

*Bus cluster respondents who travel downtown by bus, car or carpool*



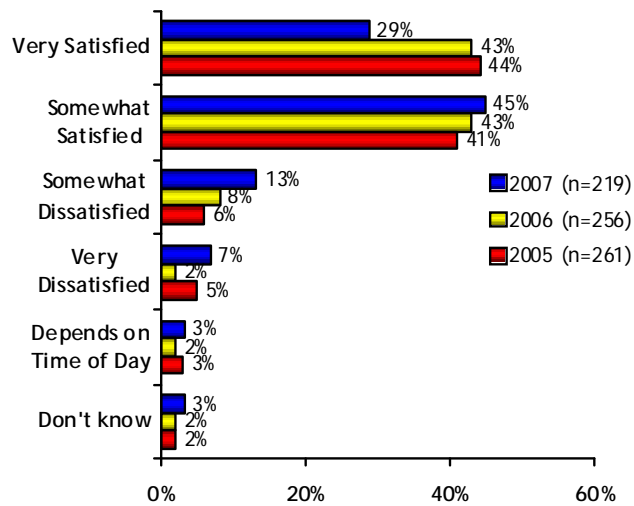
**Questions 19 and 31:**

Are you satisfied/dissatisfied with personal security and safety when in downtown Seattle?

**May not sum to 100% due to rounding.**

**Figure 21B. Satisfaction with Personal Security and Safety**

*Garage/Lot Cluster respondents who travel downtown by bus, car or carpool*



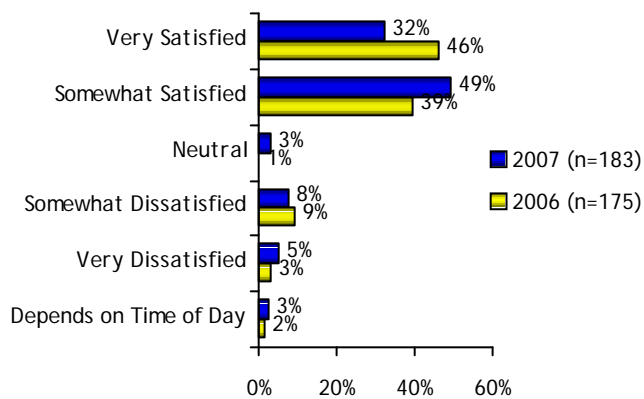
**Questions 19 and 31:**

Are you satisfied/dissatisfied with personal security and safety when in downtown Seattle?

**May not sum to 100% due to rounding**

**Figure 21C. Satisfaction with Personal Security and Safety**

*On-street parking cluster respondents who travel downtown by bus, car or carpool*



**Questions 19 and 31:**

Are you satisfied/dissatisfied with personal security and safety when in downtown Seattle

**“Don’t know” responses (1%) not shown**

**May not sum to 100% due to rounding**

### Satisfaction with Bus Travel in Downtown Seattle

In all, 90% of respondents from the Bus Cluster sample, 11% of respondents from the Garage/Lot sample and 16% of those from the Parking Meter Clusters reported riding the bus to downtown Seattle for at least one of the three trip purposes queried in the survey. Respondents who traveled by bus to downtown Seattle were asked a series of questions about their satisfaction with bus travel in and around downtown.

More than three-quarters of bus riders from the Bus Cluster Sample were satisfied with:

- *Personal security and safety while waiting for the bus during the day (87%)*
- *The location of your bus stop in downtown (87%)*
- *Personal safety on the bus related to the conduct of others (85%)*
- *The amount of personal space you have when waiting at downtown bus stops (84%)*
- *The bus coming when it is supposed to when you are leaving downtown (82%)*

Bus Cluster respondents were the least satisfied with the amount of time you have to wait in between buses (35% dissatisfied). Satisfaction with all elements was consistent with findings in 2006.

Bus riders from the Garage/Lot Cluster sample gave very similar satisfaction ratings for four of the same five elements:

- *The location of your bus stop in downtown (92%)*
- *The amount of personal space you have when waiting at downtown bus stops (88%)*
- *Personal safety on the bus related to the conduct of others (88%)*
- *Personal security and safety while waiting for the bus during the day (88%)*
- *The ability of the bus to get you to your downtown destination on time (80%)*

Bus riders from the Garage/Lot sample were least satisfied with *personal security and safety while waiting for the bus at night* (44% dissatisfied). There were not statistically significant differences in satisfaction ratings for these elements between 2006 and 2007.

Bus riders from the On-Street Parking sample also gave high ratings for four of the five elements rated highest by the Bus Cluster Sample:

- *The amount of personal space you have when waiting at downtown bus stops (97%)*
- *Personal security and safety in downtown Seattle while waiting for the bus during the day (93%)*
- *The ability of the bus to get you to your downtown destination on time (83%)*
- *The location of your bus stop in downtown (80%)*
- *Personal safety on the bus related to the conduct of others (80%)*

Bus riders from the On-Street Parking sample were the least satisfied with *the amount of time you have to wait between buses* (40% dissatisfied).

### Satisfaction with Car Travel in Downtown Seattle

Ninety percent (90%) of the respondents interviewed from the Garage/Lot Clusters, 88% of those from the On-Street Parking Clusters and 33% of those from the Bus Clusters reported traveling to downtown Seattle by car or carpool for at least one of the purposes queried in the survey. These respondents were asked a series of questions about car travel in and around downtown Seattle. Compared to their satisfaction with bus travel elements, respondents from both sample groups were significantly less satisfied with the elements of car travel in downtown Seattle.

- Fewer than 60% of Garage/Lot respondents were satisfied with any of the car travel elements included in the survey. Car travelers to downtown from this group were most satisfied with *being able to find parking that is convenient to your destination in downtown Seattle* (53% very/somewhat satisfied) and the least satisfied with *the cost of parking in downtown Seattle* (76% very/somewhat dissatisfied). Two significant differences were noted in satisfaction with car travel elements between 2006 and 2007:
- The percentage of car travelers who were “very dissatisfied” with *being able to find parking that is convenient to your destination* increased from 17% to 27%
- The percentage of car travelers who were “very” or “somewhat satisfied” with *the clarity of informational signs in downtown telling car drivers how to get around downtown* dropped from 61% in 2006 to 50% in 2007.

Only one car travel element, *clarity of the informational signs downtown telling car drivers how to get around downtown*, was rated satisfactory by at least half of the auto users from the On-Street Parking sample (57%). These respondents expressed high levels of dissatisfaction with *the cost of parking in downtown Seattle* (68% very/somewhat dissatisfied), *being able to find parking downtown* (66% very/somewhat dissatisfied), and *being able to find parking that is convenient to your destination in downtown Seattle* (57% very/somewhat dissatisfied). There were no statistically significant differences in ratings for this sample group between 2006 and 2007.

Fewer than half of Bus Cluster respondents who come downtown at least occasionally by car/carpool were satisfied with any of the car travel elements. They were the most satisfied with *the clarity of the informational signs downtown that tell drivers how to get around* (47% satisfied) and *the amount of time it takes you by car to get through downtown* (42% very/somewhat satisfied). At least six in ten auto user from the Bus Cluster group indicated they were dissatisfied with the remaining car travel elements. Satisfaction with *the amount of time it takes you by car to get through downtown* dropped from 57% in 2006 to 42% in 2007.

### Information Sources

More than two-thirds of Bus Cluster respondents (68%), and at least three-quarters of Garage/Lot (77%) and On-Street Parking Cluster respondents (75%) said they have seen signs that indicate there are traffic restrictions along Third Avenue during certain times of the day. Respondents in all three groups most commonly mentioned signs posted along the street indicating there are traffic restrictions during peak hour travel followed by “Do Not Enter” and “Bus Only” signs.

About six in ten Bus Cluster respondents (59%) were aware of the date the tunnel would re-open prior to September 24, 2007 as were 39% of Garage/Lot Cluster respondents and 37% of On-Street Parking Cluster respondents. Most respondents in the Bus Clusters group recalled getting information about the tunnel opening from transit agencies more than any other source both before and after the tunnel re-opened (49% before, 26% after). Garage/Lot Cluster respondents most commonly recalled getting information from the media (46% before, 16% after) as did On-Street Parking respondents (47% before, 14% after).

Bus Cluster respondents were significantly more likely than those in other groups to have seen information about the tunnel re-opening after September 24 (59% compared to 39% of Garage/Lot Cluster respondents and 37% of On-Street Parking Cluster respondents). At least three-quarters of those who did see information after September 24, 2007 in all respondent groups said the information they saw was informative.

Less than one in five respondents (18% of Bus Cluster respondents, 19% of Garage/Lot respondents and 14% of On-Street Parking Cluster respondents) who work or attend school in downtown Seattle were aware of any incentives or promotions urging commuters to change the way they commute.

For Bus Cluster respondents, transit agency timetables were the most popular source of get information about traveling in downtown Seattle (83%) followed by information posted at bus stops (76%), the Metro Online website (70%), Rider Alerts (60%) and transit agency brochures (48%). The most popular non-transit information sources were up-to-date traffic reports (45%) and downtown signage (40%).

Up-to-date traffic reports was the most commonly mentioned information source for respondents from the Garage/Lot Clusters (72%), followed by the Metro online website (45%), newspaper articles or TV news (45%) and regular signs posted on downtown streets (43%).

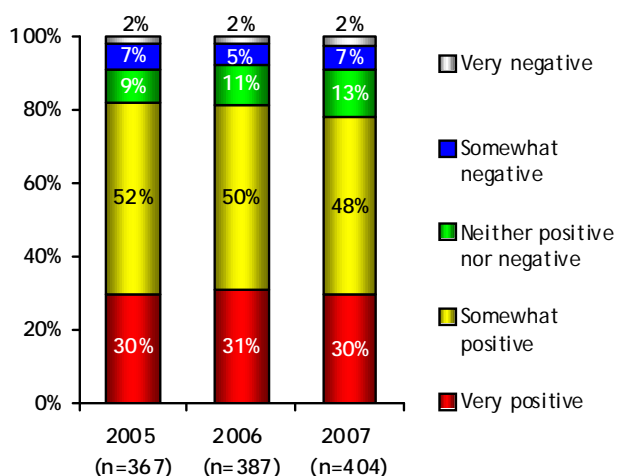
On-Street Parking Cluster respondents most commonly mentioned up-to-date traffic reports (62%) as their information source about travel in downtown Seattle followed by newspaper articles or television news (48%) and regular signs posted on downtown streets (47%). About four in ten respondents mentioned getting information from transit agency timetables (41%), the Metro Online website (40%) and transit information at bus stops (38%).

### Overall Impression of Downtown Seattle

In all, 78% of Bus respondents, 69% of Garage/Lot respondents, and 67% of On-Street Parking respondents said their recent experiences in downtown Seattle left them with a “very” or “somewhat” positive impression. The percentage of Garage/Lot respondents with a positive impression of downtown Seattle in 2007 was significantly lower than the percentage recorded in 2006 (78%).

**Figure 22A. Overall Impression of Downtown Seattle**

*All bus cluster respondents*



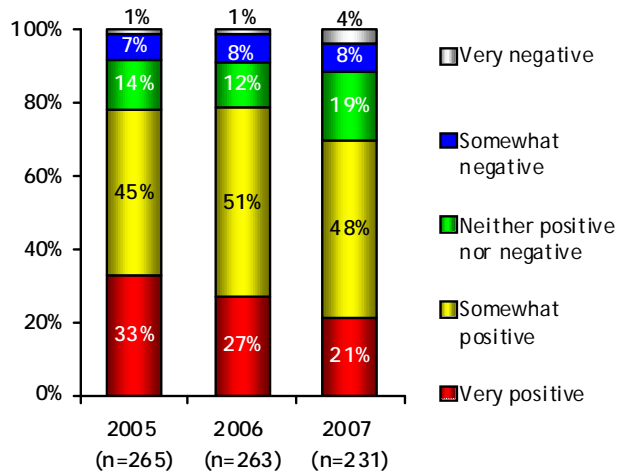
### **Question 38:**

Based on your recent experience with downtown Seattle, would you say your overall impression of downtown is...

**May not sum to 100% due to rounding.**

**Don't know responses not shown.**

**Figure 22B. Overall Impression of Downtown Seattle**  
*All garage/lot cluster respondents*

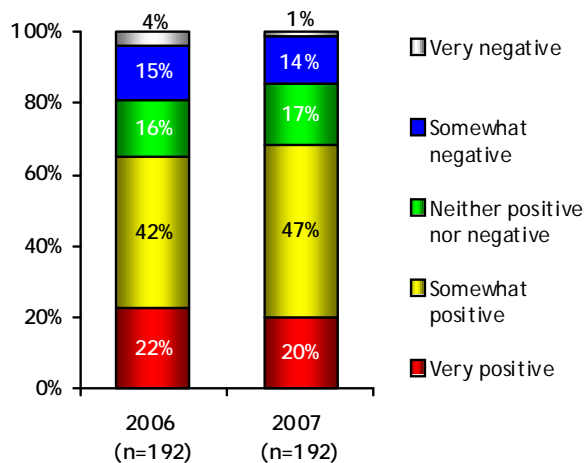


**Question 38:**

Based on your recent experience with downtown Seattle, would you say your overall impression of downtown is...

**May not sum to 100% due to rounding.**

**Figure 22C. Overall Impression of Downtown Seattle**  
*All on-street parking cluster respondents*



**Question 38:**

Based on your recent experience with downtown Seattle, would you say your overall impression of downtown is...

**May not sum to 100% due to rounding.**  
**"Don't know" responses (<1%) not shown.**

## Measure 6: Transportation Demand Management Program

### Goals and Objectives

The Transportation Demand Management (TDM) program was designed to retain and increase users of alternative modes of transportation (transit, walking, bicycling, rideshare) during the Downtown Seattle Transit Tunnel closure period. Programs were targeted towards commuters working within the Seattle Central Business District (CBD) and the International District\*. A multi-pronged approach was undertaken to achieve this goal:

- Enhancement of programs and products to retain existing users
- Broadening the scope of programs and products to attract new users (individuals and small employers)
- Creating a supportive operating environment necessary to promote alternative modes of transportation
- Educational activities to promote the current programs and assist commuters in making travel decisions
- Incentive programs to reward commuters for trying alternative methods or committing to major changes

*\* This includes the area south of Stewart Street, north of Dearborn Street, west of I-5, and east of Elliot Bay.*

Primary activities that occurred in this final reporting period included targeted outreach to small employers promoting telework programs, and targeted outreach at major commercial buildings, employers, and point of sale outlets aimed to provide individuals with both the incentives and the knowledge to use current programs.

### Data Collection

Each TDM program has been monitored and tracked to determine its attractiveness and effectiveness. The data was collected on a monthly basis and includes number of people served and number of people using a particular TDM option. As a way of measuring continued progress, the numbers from this period are compared to the current program totals.

### Summary

The package of TDM programs introduced in support of tunnel closure has successfully expanded participation in commute options. Some highlights include:

- Over 650 individuals received transit information at Plan Your Commute tables this period. Of the 571 people who pledged to reduce their drive alone trips, nearly 350 of them reported completing their pledge, eliminating an estimated 14,000 VMT.
- 7,000 individuals and 70 businesses have joined Flexcar, now known as ZipCar, in the last period of tunnel closure mitigation efforts.
- 89 individual Puget Pass holders signed up for the Home Free Guarantee (HFG) in the third period, bringing the total to over 750 since program initiation.
- Registration activity at Rideshare Online continues at an accelerated pace, with 612 new registrants this period and about 2,270 total registrations by downtown employees since DSTT closure.
- The number of merchants participating in the current edition of the Shop, Dine & Ride book remains at 144.



- Continuing efforts: Some TDM efforts will be continuing through 2008, including Home Free Guarantee for individuals buying Metro passes and telework support for new programs. In addition, a new effort has been initiated to enhance bicycle commuting, specifically by improving bike/bus connections.

**Figure 23. Transportation Demand Management Reporting Period Data (June 2007- November 2007)**

Existing Programs with Enhancements	# of New Participants (June 2007- Nov 2007)	Current Total (Since initiation of TDM program in August 2005)
Puget Pass Consignment		
# of Accounts	5	82
# of Passes	77	5379
FlexPass*		
# of Contracts	**	220
# of Passes	**	11,703
Rideshare (Carpool, Vanpool, VanShare)		
# of VanPools and VanShares***	3	63
# of VanPool Users**** (riders)	33	198
Rideshare Online		
# of Registrants	612	2266
Flexcar(ZipCar)		
# of Business Contracts	70	350
# of Individual Contracts	7,000	14,000
New Programs to Increase and Retain Users of Alternative Travel Modes	# of New Participants (June 2007- Nov 2007)	Current Total (Since initiation of TDM program in August 2005)
Home Free Guarantee (HFG) for Individuals		
# of Accounts	89	752
# of Rides (usage)	9 individual, 3 company	91
Plan Your Commute		
# of Participants	645	2121
# of Free Ride Tickets Distributed	1550	23,990
# of Completed Pledges to Drive Less	348	348
# of Estimated Miles Reduced for Pledge	13,980	13,980
% of Tickets Redeemed	27% (1420)	
Telecommuting		
# of Workshops	1 seminar, 2 webinars	1 seminar, 2 webinars
# of Companies enrolled in mini-grant telework program	8	8
New Programs to Support the Operating Environment of Alternative Modes	# of New Participants (June 2007- November 2007)	Total (Since initiation of TDM program in August 2005)
Bicycling		
# of 3-hour Workshop Participants	0	77
Shop Dine & Ride		
# of Retail Participants	144	144

\* - FlexPass and FlexPass + CT added together

\*\* - Numbers were not provided for the current reporting period. Total numbers reflect activity through May 2007.  
Updated numbers will be available late January 2008.

\*\*\* - Rideshare totals (accounts and users) from STAR Carpools, Metro Vanpools, Community Transit Vanpools, other Vanpools, and Metro VanShare. Carpools do not include City of Seattle registrations.

\*\*\*\* - Estimates based on 7 riders per Community Transit vanpool

## **Program Notes**

### Plan Your Commute (PYC)

Plan Your Commute sessions, renamed “Green Up Your Commute”, were offered September 17 - October 10, 2007 at several locations throughout downtown Seattle. In addition to receiving personalized trip plans and transit information from rider information officers, visitors could pledge to eliminate two drive-alone trips by the end of October. In exchange for completing their pledge, participants were mailed one of five rewards.

Of the 645 participants, 348 (54%) reported successful completion of their pledge. Of the pledge completers, 79% reported changing commute trips, and 63% reported that they were very likely to regularly use the non-SOV mode for the trip in the future.

### Bicycle Enhancements:

King County has recently assumed responsibility for implementing \$100,000 of bicycle transportation enhancements. Expanding the functionality of the online trip planner will likely be the primary focus of these enhancements. The County is currently working with a consultant to allow riders to find the most efficient routes within biking distance of their origin and/or destination. These changes are planned to launch in conjunction with Bike to Work Day in May 2008.

### Puget Pass Consignment:

There were five new Puget Pass Home Free Guarantee (HFG) consignment accounts created in the past six months. With 12 total rides taken during the fourth period, (HFG) usage was lower than last period's total of 26. Usage remains at less than 1% of total pass holders.

### Home Free Guarantee (HFG) for Individuals

Monthly Puget Pass holders who work in downtown are eligible for Metro's HFG program at no cost. An additional 89 downtown Seattle commuters have signed up for the benefit in the past six months. This promotion will extend into 2008.

### Telework

Three telework seminars were held this fall. The county and its telework consultant have established agreements with eight companies to create telework implementation plans. The consultant will be working with the companies to strategically introduce telework concepts to the organizations, develop appropriate business policies, and facilitate the technological aspects of the programs. Mini-grants for technology purchases will be available if needed. The programs should be implemented in Spring/Summer 2008.

### Rideshare

There are 26 new Metro VanPool users since June 2007. Meanwhile, Rideshare Online has seen a significant increase in online registration, with 612 new registrants in the past six months.

### Flexcar (Zipcar)

Flexcar numbers have increased dramatically. In the past six months, 70 new businesses and 7,000 individuals have joined Flexcar. This service has been renamed ZipCar.

### Shopper Incentives

One hundred forty-four retail service providers participated in the fourth phase of the Shop, Dine and Ride program. The program encourages commuters and shoppers to continue to visit downtown Seattle throughout the tunnel closure period.